ENGINEERING LIBRARY

SEP 9 1948

Paper TRADE JOURNAL

REG. U. S. PAT. OFF.

VOLUME 127, NO. 9

AUGUST 26, 1948

PUROCELL

REG. U. S. PAT. OFF.

A highly purified, bleached Cellulose product especially suitable for high grade Writing, Bond, Ledger and other fine papers. Produced by a new chemical process by

EASTERN CORPORATION

Pulp and Paper Mills

SOUTH BREWER, MAINE LINCOLN, MAINE

For samples and further information, please address

SOLE SELLING AGENTS

GOTTESMAN & COMPANY

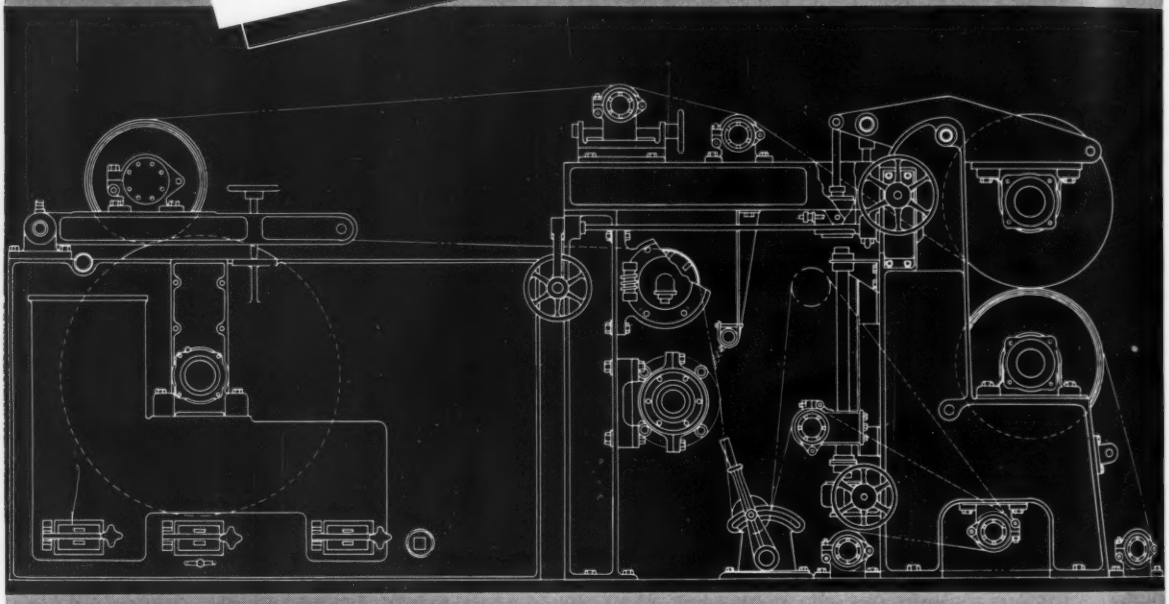
— INCORPORATED —

22 EAST 40th STREET • NEW YORK 16, N. Y.

EUROPEAN OFFICES: Birger Jarlsgatan 8, Stockholm, Sweden

Modern Wet Machine

BUILT TO PAPER MACHINE QUALITY SPECIFICATIONS



This Downingtown Wet Machine is designed and built for low maintenance. It will pay for itself and return substantial dividends on the investment. Everything in its make-up is "the best". . . . Ends are of cast iron and the body is 3-inch Low Land Cypress.Whipper is balanced, all metal with four bats. Felt is continuously maintained in proper condition by a Downingtown Suction Felt Roll. The machine can be equipped with Pneumatic Loading and Lifting Equipment, if desired. . . . Naturally, this DeLuxe Downingtown Wet Machine costs a little more than the "ordinary," but we believe you'll agree that it's worth a lot more.

DOWNINGTOWN MANUFACTURING CO., DOWNINGTOWN, PA.

Write us for prints, specifications and a quotation. Deliveries are good.

DOWNINGTOWN

Designers & Builders
Paper Making Machinery

IN THIS ISSUE

AUGUST 26, 1948

Paper Tonnage And Sales Value Growing	11	FINANCIAL RECORD	38
Bulkley, Dunton Building World-Wide Sales Distribution	12	PRODUCTION RATIO REPORT	40
Takes Labor Plight To Newspapers	12	OBITUARY	41
What Pines Grow Best Where, Experiments Seek To Discover	13	INDUSTRIAL DEVELOPMENT	43
Logging Equipment Demonstration	13	Effect of Some Manufacturing Variables on the Properties of Fiberboard Prepared from Milled Douglas-Fir	43
Gum Resin Output Climbing	15	EQUIPMENT AND SUPPLIES	51
United States Imports And Exports	16	TAPPI SECTION	53
Pulp And Paper Trade Of Eight Nations	20	Testing Printability of Paper With Ink—II	53
Northeastern Superintendents Program	24	Some Basic Concepts of Statistics and Their Application to Simple Industrial Experimentation	54
TRENDS	30	TAPPI Plastics Conference	58
Letters	30	Standard Terms Used in the Sulphite Pulping Process	60
IMPORTS	32	CLASSIFIED ADVERTISING	64
PRICES	34		
MARKETS	36		

INDEX TO ADVERTISEMENTS ON PAGE 78

Volume 127 **Number 9**

Paper TRADE JOURNAL

REG. U. S. PAT. OFF.

Executive and Editorial Offices: 15 W. 47th St., New York 19, New York
Published Every Thursday by Lockwood Trade Journal Co., Inc.

GEO. E. LOCKWOOD, *President & Treasurer*
ARTHUR E. GORDON, *Vice-President*
JOSEPH P. HORGAN, *Secretary*

H. G. HEITZEBERG, *Editor*
E. P. MCGINN, *Industrial Editor*

E. P. NUTTALL, *Assistant Editor*
R. G. MACDONALD, *"TAPPI" Editor*
F. B. GROSSE, *Production Manager*

Eastern Representatives

BRUCE E. BROWN
15 W. 47th St., New York 19, N. Y.; Phone PLaza 7-2370
EDWARD H. DOERING
15 W. 47th St., New York 19, N. Y.; Phone PLaza 7-2370

Pacific Coast Representatives

ROY M. MCDONALD & CO.
San Francisco, 4, Cal., 564 Market St.; Phone YUkon 6-0503
Los Angeles, 5, Cal., 639 S. Wilton Pl.; Phone Drexel 2590
Seattle, 1, Wash., Terminal Sales Building; Phone Main 3860

Mid-Western Representatives

H. K. VINTON
30 N. Dearborn St., Chicago 2, Ill.; Phone Central 2784
FRANKLYN H. OLSEN
4892 Oakland Drive, Lyndhurst, Cleveland, 21, Ohio; Phone—EVergreen 5288

Southern Representative

EDWARD M. BUCK
1000 Main St., Dallas, Texas; Phone Riverside 5625

Representative for Denmark, Norway, Sweden and Finland

OXFORD TRADING AKTIEBOLAGET
Bibliotekgatan 6-8, Stockholm, Sweden

Subscriptions: (Payable in advance) By the year, $5.00; Single Copy, 15 Cents. *Postage Extra: To Canada,* $2.00; *To Other Foreign Countries,* $3.50. Member Audit Bureau of Circulation.

PAPER *established Feb. 17, 1899, combined with* PAPER TRADE JOURNAL, *Nov. 16, 1899.* PAPER *established Sept. 21, 1910, combined with* PAPER TRADE JOURNAL, *Feb. 19, 1926.*

All rights to the above titles reserved.
PAPER TRADE JOURNAL *is entered as Second Class matter at the Post Office at East Stroudsburg, Pa., under Act of Congress of March 3, 1879. Publication Office at Lockwood Trade Journal Co., Inc., 34 N. Crystal St., East Stroudsburg, Pa. Printed in U. S. A.*
Copyright 1948 by the Lockwood Trade Journal Company, Inc. The contents of PAPER TRADE JOURNAL, *including all articles, illustrations, etc., are covered by copyright and may not be reprinted except by permission.*
PAPER TRADE JOURNAL *is indexed in Industrial Arts Index.*

CALENDAR OF COMING EVENTS

ASSOCIATION EXECUTIVES: Please send us your meeting dates and locations for this column as far in advance as possible. No charge for publication.

SEPTEMBER 8-10: Technical Section, Canadian Association. Hotel Vancouver, Vancouver, B. C., not Harrison Hot Springs, as previously announced.

SEPTEMBER 13-17: Third National Instruments Conference and Exhibit. Convention Hall, Philadelphia.

SEPTEMBER 17: Northeastern Wood Utilization Council. Boston, Mass.

SEPTEMBER 27-29: TAPPI Mechanical Pulping Conference (Joint meeting with CPPA Technical Section) Poland Springs House, Poland Springs, Maine.

OCTOBER 11-13: TAPPI (U.S.) and Canadian Technical Section. Technical Pulping, Poland Springs, Maine.

OCTOBER 11-14: TAPPI Testing Methods Conference at Mellon Institute, Pittsburgh, Pa. Headquarters, William Penn Hotel.

OCTOBER 21-23: Joint Meeting, Southern and Southeastern Superintendents Divisions. Biltmore Hotel, Atlanta, Ga.

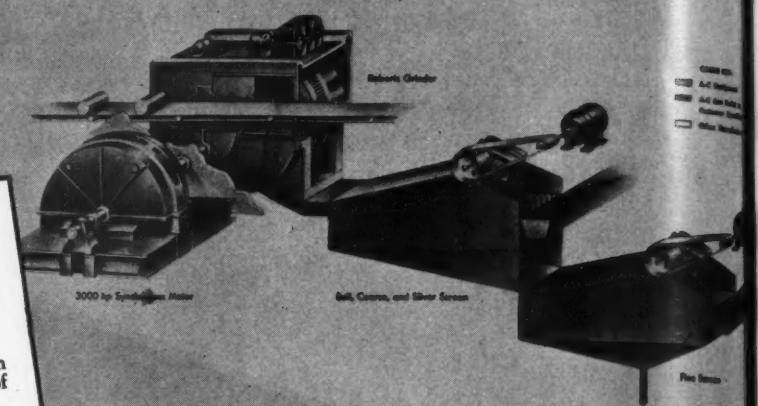
OCTOBER 25-28: Third Engineering Conference of the Pulp and Paper Industry Statler Hotel and Westinghouse Electric Co., Auditorium, Buffalo, N. Y.

Faced with Equipment

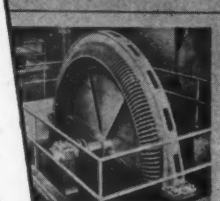
7 GROUNDWOOD PROCESS

THE ACCOMPANYING FLOW SHEET pictures a new system for the production of groundwood. It consists of a Roberts* grinder driven by a 3000 hp synchronous motor (outer shell by worm gear and direct-current motor drive); a rugged *Low-Head* vibrating screen with a ⅛ inch perforated deck designed to replace the customary bull, splinter and coarse screens

LOW-HEAD Screens Save Equipment



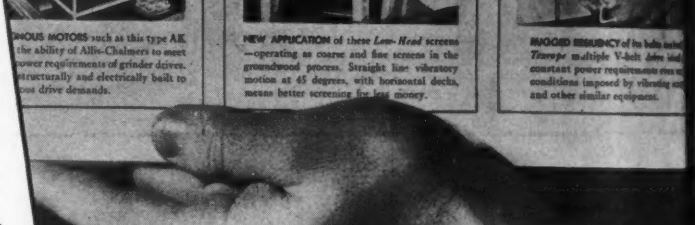
3000 hp Synchronous Motor — Roberts Grinder — Bull, Coarse, and Sliver Screen — Fine Screen



SYNCHRONOUS MOTORS such as this type AK, suit the ability of Allis-Chalmers to meet the power requirements of grinder drives. They're structurally and electrically built to meet those drive demands.

NEW APPLICATION of these *Low-Head* screens—operating as coarse and fine screens in the groundwood process. Straight line vibratory motion at 45 degrees, with horizontal decks, means better screening for less money.

WOODED RESILIENCY of his belts makes *Texrope* multiple V-belt drives ideal for constant power requirements even under conditions imposed by vibrating screens and other similar equipment.



THESE QUESTIONS CONCERN EQUIPMENT YOU USE ... KNOW THE ANSWERS?

1. Why does straight-line vibratory motion on chip screens result in a higher percentage of uniform chips than circular motion?
2. How can expense of wet lap production be eliminated entirely in beating operations?
3. What's easiest, quickest way to synchronize rolls on slitting and rewinding machines?
4. What solids pump handles up to 40 percent solids in suspension?
5. Why is separation of high and low voltage important in switchgear?
6. Of what material should internal pump parts be made for pumps handling starch solutions?
7. What's best way to hold fiber loss to a minimum on knotting screens?
8. What Allis-Chalmers device has been used successfully to reduce acceleration and deceleration time on paper machines?
9. What's easiest way to replace batch bleaching with continuous bleaching operations?
10. What percentage of bone-dry chemical pulps can be pumped with Allis-Chalmers Hi-Density Feeder?

Here Are the Answers . . .
Turn Page Upside Down

1. Chips are carried along on their sides; they do not up-end or lodge in screen openings.
2. Install a Hi-Density Feeder.
3. Use a Vari-Pitch Sheave.
4. Allis-Chalmers CW pump.
5. Safety.
6. Bronze.
7. Use adjustable sprays.
8. Regutex control.
9. Install a Hi-Density Feeder.
10. 8 percent.

A 2448

SEND FOR THIS

IT'S MORE THAN just another sales bulletin — this new pulp and paper book enables you to *see* the anatomy of modern, efficient pulp and paper operations by means of model flow sheets and pictures.

When you get your copy, notice how completely Allis-Chalmers fits into your industry as a *pulp and paper* equipment supplier. From woodlot to finished product.

Low-Head, Texrope, Hi-Density, Vari-Pitch and Regulex are Allis-Chalmers trademarks.

ALLIS-

One of the Big 3 in Electric Power

Paper TRADE JOURNAL

VOL. 127, NO. 9 REG. U.S. PAT. OFF. AUGUST 26, 1948

Paper Tonnage and Sales Value Growing

WASHINGTON—New records were set by the pulp and paper industry during the first six months of 1948, when the total sales value of all products amounted to $3,043,000,000, according to the August *Pulp and Paper Industry Report* of the Department of Commerce. The report states that this figure is more than a billion dollars above that for the first half of 1946, and $234,000,000 higher than the figure for the first six months of last year.

W. L. Neubrech, pulp and paper specialist, Office of Domestic Commerce, stated that while sales in terms of value reflect price increases in pulpwood, wood pulp, paper, board and products, there was also a substantial gain in physical output of paper and paperboard. As a result the first six months of 1948 established an all-time production record. Production in the first half of 1948 of all types of paper and board amounted to 11,146,000 tons, an increase of six percent over the same period of 1947 and 18 percent over the first six months of 1946.

The pulp and paper industry continues to be a leading factor in the foreign trade of the United States, Mr. Neubrech said. Imports of pulpwood, wood pulp, newsprint, and to a lesser extent of other classes of paper, board and products, amounted to $378,000,000 in the first six months of 1948, compared with $287,000,000 in the same period of 1947.

United States exports, on the other hand, continue relatively small and amounted to only $75,000,000 for the first half of this year, compared with $84,000,000 for the same period of 1947. Many of the larger U.S. paper exporters state that exports this year would have been much greater if dollar exchange in principal foreign markets had not deteriorated to the extent of requiring import restrictions on most grades of paper, board and products. Loss of such markets in Canada, Latin America, and Far Eastern areas will not be offset by increased purchases of European countries through the use of ECA funds. It is believed that only small quantities of paper, board or products of U.S. manufacture for European destination will be procured under the foreign aid program.

The end of the first half year appears to mark a more or less complete readjustment in the United States pulp, paper and allied products industry, according to the report. Trade reports from Department of Commerce field offices indicate that the general market situation is solidifying, following the considerable uncertainty prevailing since early in the year. The majority of manufacturers, converters, and wholesalers again look for a steady volume of business during the remainder of 1948.

Certain underlying conditions have changed materially from six months or a year ago. Mill inventories of basic raw materials, including pulpwood, wood pulp, and waste paper, are considered highly satisfactory as of the end of June.

DEON SUTTON

—manager of the new Paris, France, office of Gaillet & Hartig Co., Inc., of New York. Mr. Sutton's office is at 21 Rue de Berri, Paris 8e . . . A graduate of the University of Notre Dame, Mr. Sutton was formerly connected with the American Embassy in Paris . . . The Gaillet & Hartig Co. Inc., is the exclusive representative of the Black-Clawson Co., Hamilton, Ohio, and Black-Clawson Co., (England) Ltd., of Morden, Surrey, for France and Belgium, and is also agent for several French paper mills on their exports to the U. S. and other countries.

In the case of market wood pulp, inventories in the hands of paper and paperboard mills at the end of June totaled 539,000 short tons, a gain of nearly 57 percent over the end of June 1947. These stocks represent 60 days requirements on the average. Imports of wood pulp in the first half of this year totaled 1,202,000 short tons, against 1,023,000 in the first six months of 1947. Thus, the principal difficulty of many nonintegrated paper mills during the war, and up until recent months, has been largely overcome.

The industry's general position is further reflected at the wholesale distributors level. Total value of sales for the first half of 1948 is estimated at $756,000,000, compared with $736,000,000 for the same period of 1947 and $589,000,000 in the first six months of 1946. Wholesale paper merchants' inventories continued their rapid rise through the first five months of 1948, but experienced a slight decline in June (1.3 percent). Current field office reports point out that merchant stocks are now considered good and generally in balance, with purchases being made only to replace stock sold, and in a few instances to build up stocks of items which have been scarce until recently. Merchants state that most supplying mills have abandoned allocation systems entirely, with others expecting to follow suit in August or September.

Like manufacturers, wholesalers are optimistic regarding a steady market for the remainder of this year, but observe a return to prewar competitive conditions in terms of quality and service.

Mr. Neubrech pointed out that while there have been some price advances by both mills and distributors recently, the general price level has remained relatively stable. One particularly interesting development is that, even in view of competition, most manufacturing mills have seen fit to reduce their weekly production time, rather than attempt to cut prices in order to obtain a larger volume of business, as was customary in prewar years. Increasing costs of operation in terms of labor and raw materials have placed the break-even point for many mills on such a high level that it is more feasible to reduce the work week and, therefore, their production, than to lower prices.

Bulkley, Dunton Building World-Wide Sales Distribution

NEW YORK—Establishment of Bulkley, Dunton sales offices in South Africa is reported by George G. Cobean, president of the Bulkley, Dunton Paper Co., S.A., the paper exporting unit of the organization.

Frank W. Smith, vice-president, and Albert Andrews, who will have charge of South Africa operations, are in Johannesburg completing arrangements to set up offices in strategically located cities of the Union.

The Union of South Africa is experiencing rapid industrial and commercial development and graphic arts standards there reflect strong demand for high grade writing, book, and packaging papers.

After the return of Frank W. Smith in November, Mr. Cobean will leave on an extended trip to the Far East and eventually around the world, with a view to further developing his company's exporting business, which now extends to four continents with over 60 offices and sales representatives. On his trip, Mr. Cobean, with the help of his company's field representatives, will survey economic and competitive situations in foreign markets.

Mich. Superintendents Meeting

KALAMAZOO, Mich. — The first fall meeting of the Michigan Division of the American Pulp and Paper Mill Superintendents Ass'n., Inc., will be held at Hotel Harris on September 16. Dinner will be served at 6:30. Tickets may be purchased.

The Noble and Wood Machine Co., manufacturer of paper mill machinery, Hoosick Fall, N. Y., through its local representative, C. B. Smith, has arranged the program for the evening. Title of the paper to be presented is "Controlled Flow Victory Beater."

This talk will be augmented with slides and a panel of local superintendents will aid the speaker, L. E. Randecker, conservation coordinator of the Hammermill Paper Co., Erie, Pa.

Glen Sutton of Sutherland Paper Co., fourth vice-president of the national association, will present the Recognition Award Certificate to Past Chairman William H. Astle of the Michigan Paper Co., Plainwell, Mich., Olin W. Callighan, secretary-treasurer of the Michigan division, reports.

Forest Products Section Meeting

NEW YORK—The Northeast Section of the Forest Products Research Society will hold its second meeting of the current year at Hotel Pennsylvania, October 21-22. Participating will be section members and their guests from New York, New Jersey, Pennsylvania, the New England states and Canada. The program for the inaugural session, announced by W. Burdette Wilkins, chairman of the section, has been keyed to problems currently encountered in wood-working plants.

The October 22 session, commencing at 9:30 a.m., will be primarily concerned with research and development in the wood industry when papers dealing with "The Future of Research in the Paper Industry" will be among those delivered. As with the previous day's sessions, floor discussion time will be emphasized.

No formal afternoon session is planned for the closing day in order to assure a final opportunity for individual business or social discussions.

Programs and additional details may be had by writing to F. Powell Forbes, Weyerhaeuser Timber Co., P.O. Drawer 629, Newark 1, N. J.

Reds Offer Aussies Newsprint

CANBERRA, Australia — The Soviet Union is in a position to supply Australia with newsprint and timber in exchange for manufactured goods, according to a trade survey released on August 18 by Feodor Kroutikov, Soviet commercial attache, who arrived here this week from Moscow.

Chicago Paper Ass'n. Outing

CHICAGO—The Chicago Paper Ass'n. will hold its annual golf tournament and outing at Medina Country Club on August 31. Chairman of the meeting is Joseph S. Druth of Chippewa Paper Products Co., 3315 West Forty-Eighth place.

New England Merchants Outing

BOSTON — The New England Paper Merchants Ass'n. outing to be held at the Wannamoisett Country Club, Providence (Rumford), R.I., on September 28, will be open to paper merchants of New England, their paper mill friends and the merchants' customers on invitation of the paper merchants, as heretofore. The program includes a golf tournament, outdoor sports, including bowling on the green, horseshoe pitching, buffet luncheon at noon and a dinner.

Fire Prevention Week, Oct. 3-9

NEW YORK—Fire Prevention Week will be observed this year October 3-9, the National Board of Fire Underwriters, 85 John street, reports.

Available to industrial firms, forest interests and others, to publicize the occasion are five posters, two leaflets for distribution or mailing, and four educational booklets.

Posters include: "Stop Fire, the Fifth Horseman," "Remember, I'm Not Fireproof," "Warning," "Stop Fire," and "Fire Kills Five Girls to Every Three Boys." *Leaflets* include: "Sixty Ways to Prevent Fires in Your Home," "What Causes Destructive Fires," and "Fifth Horsemen" stickers. *Educational Booklets* include: "The Fire-Safe Home," "Fire Safety on the Farm," "Stop Fires — Save Jobs," and "Safeguarding Industry."

Chemical Production Climbs

WASHINGTON — Chlorine production reached a record level in this country in June, the Bureau of Census reported on August 18, exceeding the previous high of 132,668 short tons, reached in March, by 563 tons.

Soda ash production, ammonia soda process, total wet and dry, was 347,656 short tons in June, compared with 360,110 short tons in May.

Wrapping Paper Meeting

CHICAGO—A regional meeting of the wrapping paper merchant members of the National Paper Trade Ass'n. will be held at Hotel Blackstone, beginning at 10:30 a.m., August 30.

Takes Labor Plight to Newspapers

COVINGTON, Va. — In an advertisement placed in a Covington newspaper on August 12, the West Virginia Pulp & Paper Co. explained its stand in current labor difficulties involving its employes.

Acknowledging the fact that negotiations were at a standstill, the company's ad reviewed the pay offers that have been made by the management.

"The five cents per hour increase granted in June, plus the six cents we've been ready to add for over two months would put our pay even with the biggest and richest company in the pulp and paper business," it was stated.

The advertisement also pointed out the advantages of the Christmas gift made by the company and the pension plan. Commenting on union claims that the paper firm wanted to take away the employe's seniority, the ad said, "The company, on the other hand, claims the union is insisting on an extreme form of seniority which won't and can't work in our set-up." It emphasized that each mill is a combination of several different plants. The paper firm management stated in the ad that it had attempted to propose a compromise but that the union would not change its stand.

West Virginia Pulp & Paper Co., asserting that further advertisements would be used to tell its side of the argument, explained that "a strike can cost all of us, and many innocent bystanders, a lot of money and trouble." Management indicated that the company would remain firm in its stand on the issues of the dispute.

What Pines Grow Best Where, Experiments Seek to Discover

SUMMERVILLE, S. C. — About 2,225,000 pine seedlings were planted in North and South Carolina by the West Virginia Pulp & Paper Co. during the 1947-48 planting season, it was reported on August 11 by company officials.

The planting, which was carried out between November and March, covered ten counties of the two states. Twenty-four of the 85 work days allotted to the planting program were lost because of heavy rainfalls. Although the bulk of the work was done by hand, a planting machine was used to advantage when conditions permitted.

The company planted loblolly, slash, longleaf and spruce pine in a variety of sites, including cut-over woods, good warm land, wet boggy areas, dry ridge tops, coastal plain swamps, Piedmont hills, crawfish flats, scrub oak ridges, heavy clay soils and deepest sands.

From a reforestation standpoint, the plantations established in such problem areas as crawfish flats and scrub oak ridges will be watched with greatest interest, the company said. Timber in crawfish flats generally is short, inferior and slow-growing. Extreme difficulty has been experienced in growing commercial trees on scrub oak ridges.

In an experimental effort to produce trees of commercial value on these tracts company foresters selected and planted strong spruce pine seedlings. They hope the spruce pine will be able to grow in the acid soil of the flats and will survive in competition with scrub oak on the ridges.

All the spruce pine was raised from seed collected by company labor on lands in the Charleston district during the fall of 1946. Cones were cut from tree tops which were on the ground following logging. Seeds were extracted and cleaned by the South Carolina State Nursery at Wedgefield. With the exception of a small number planted in the West Virginia Experimental Forest at Andrews, S.C., the seeds were planted at the South Carolina Nursery and yielded about 400,000 one-year seedlings for planting.

The remainder of the planting stock, including loblolly, slash and long-leaf pine, was provided by the South Carolina Nursery and the North Carolina State Nursery at Clayton, N.C. The South Carolina Nursery provided 400,000 loblolly pine, 400,000 slash pine and 50,000 long-leaf pine. The North Carolina Nursery at Clayton supplied nearly 1,000,000 loblolly seedlings and about 30,000 slash pine seedlings.

The company announced that preliminary plans had been drafted to continue the planting next winter in the Carolinas as part of its long-range program of reforestation and conservation. In addition to the planting of seedlings, the company is endeavoring to develop a direct seeding technique for use in areas where handling of planting equipment is difficult.

Soundview Buys Salvage Timber

EVERETT, Wash. — The Soundview Pulp Co. was the successful bidder in a U. S. Forest Service salvage timber sale late in July when the company paid $16,567.50 for a total of 1,750,000 feet of dead and down timber in the logged area around Baker Creek in the Mount Baker national forest, including removal, with an additional $350 slash price.

Jack Hogan, timber sales manager of the Forest Service, who conducted the sale, said the price paid was a good one for material that a few years ago would have gone to waste. It included 1,300,000 feet of Douglas fir, 400,000 feet of Western red cedar and 50,000 feet of hemlock, silver fir and other species.

Rourke-Eno Buys Building

HARTFORD, Conn.—The Rourke-Eno Paper Co., has bought the four-story brick and basement building at 133 Walnut Street. The structure, which has a floor area of 12,000 square feet, will be used as a warehouse.

LOGGING EQUIPMENT DEMONSTRATION

ON SEPTEMBER 8, the latest equipment for logging will be demonstrated on the Mike Kalan woodlot, which is located about nine miles southwest of Cooperstown, N. Y. . . The map above shows the automobile route from Cooperstown to the site of the demonstration. Half a million dollars worth of the newest in chain and circular saws, cable skidding outfits, crawler tractors, log and boltwood loads, logging trucks, road-building machinery and portable sawmills will be demonstrated under actual woods conditions. Admission is free, no fees will be charged visitors, and box lunches will be sold at the field at reasonable prices. A preview of some of the equipment will be televised over Station WGY-TV, Schenectady, N. Y., at 7:30 p.m. Septembr 7 . . . Cooperstown, incidentally, is the home of Baseball's Hall of Fame.

REPUBLIC'S ENDURO PLANT NO. 2 OPERATING

PRODUCTION at the Republic Steel Corp., new Enduro Plant No. 2 in Massillon, Ohio, is under way. Pictured here is stainless steel in production in the new plant. UPPER PICTURE: After an intermediate pass through the anneal and pickle lines after being rolled, the stainless steel is inter-wound with paper to protect its finish. Here the coil is being further reduced in the 54-inch mill and the paper is being gathered as the coil is unwound. LOWER PICTURE: Sheets of paper are laid between sheets of stainless steel in Enduro No. 1 plant to protect the finish of the sheets while in storage and in transit. The plant uses 300 tons of anti-tarnish kraft monthly.

Foxboro Planning Exhibit

FOXBORO, Mass. — The Foxboro Co., exhibiting at the Third National Instrument Conference and Exhibit at Convention Hall, Philadelphia, September 13-17, will demonstrate its multi-record dynalog recorder, auto-selector controller, dew point recorder, Type 17 meter, Model 42 transmission system, Model 40 controller, d/p cell (differential pressure) transmitter, and a new resistance bulb.

Infilco Advances Starling, Eideness

CHICAGO—Infilco Inc., manufacturer of water conditioning, sewage and trade waste treating equipment, has named Charles H. Starling as Southeast district engineer with headquarters in Decatur, Ga., to replace Fred A. Eideness who will become Philadelphia district engineer under jurisdiction of Infilco's New York office. Both appointments are effective September 1.

Ansul's Wedge to Marinette

MARINETTE, Wis.—Franklin Wedge, former eastern manager for the Ansul Chemical Co., recently appointed assistant to the president, has moved from Philadelphia to the company's main office here.

Mathieson Advances Thomas

NEW YORK—Frank W. Thomas, Jr., has been named assistant general manager of sales of the Mathieson Chemical Corp.

Now Cowles Chemical Co.

CLEVELAND—At a meeting on August 16, stockholders of the Cowles Detergent Co. approved a resolution changing the firm's name to Cowles Chemical Co. No change in management or ownership of the company is effected by the stockholders' action and no alteration of the company's sales policies is anticipated, C. C. Bassett, vice-president and director of sales, states.

Timken Policy FOB Mill

CANTON, Ohio—Taking cognizance of the recent Supreme Court decision on the Cement Case, the Timken Roller Bearing Co. has announced that effective August 23, and until further notice, products of the steel and tube division will be sold, quoted and invoiced f.o.b. mill.

Monteith Succeeds Smith

PITTSBURGH — A. C. Monteith has been elected vice-president in charge of engineering and research of the Westinghouse Electric Corp. He succeeds Marvin W. Smith who has become executive vice-president of the Baldwin Locomotive Works.

Mathieson Buys War Plant

WASHINGTON—Sale of the Government-owned Mathieson Alkali Works, Lake Charles, La., to the war-time operator, Mathieson Chemical Corp., New York, N.Y., for $7,063,300, was approved by War Assets Administration on August 9.

Managing Industrial Sales

PHILADELPHIA—Ray R. West has been named manager of sales of Minneapolis-Honeywell Regulator Co. products for industrial applications. He will have his headquarters at the Brown Instrument Co., plant in this city.

Kolstad Adds Wilson Line

LONG BEACH, Calif.—A. Kolstad of the Kolstad Engineering & Sales Co., 38 Giralda walk, has been appointed sales representative for Thomas C. Wilson, Inc., manufacturer of tube cleaning equipment.

Harman Promoted by Bailey

MILWAUKEE—G. L. Harman, Jr., has been appointed manager of the Bailey Meter Co., local branch office replacing R. V. Knapp, who resigned to accept a position with the Mosinee Paper Mills Co., Inc.

Greenland Heads Seattle Office

TRENTON, N. J. — J. A. Greenland has been named district manager of the Seattle office of the De Laval Steam Turbine Co. He has been with that office since May, 1940.

Link Belt at Chemical Show

CHICAGO — The Link-Belt Co. exhibit at the National Chemical Exposition, October 12 to 16, will be divided into three parts. The first section will cover drying and cooling equipment and methods, featuring the L-B Roto-Louvre, Multi-Louvre and other Link-Belt units. The second section will be devoted to L-B elevators, conveyors and screens. Installation photographs and an operating unit of the new Link-Belt Oscillating Trough Conveyor will be on display. The third section will feature Link-Belt power transmission units, including operating models of speed reducers, Gearmotors, Electro-fluid drives and the P.I.V. Gear variable-speed transmission. Displayed also will be combinations of these power transmission units with both roller chain and silent chain drive takeoffs.

Douglas Joins Heyden Co.

NEW YORK—Heyden Chemical Corp., named Charles V. Douglas as assistant to the vice-president in charge of sales. Mr. Douglas, who has been associated with the Diamond Alkali Co. and its subsidiaries for 26 years, will assist Vice President J. P. Remensnyder.

Before joining Heyden, Mr. Douglas was New York district manager for Diamond Alkali. Prior to that he was for nine years president of a wholly-owned subsidiary, the George Chemical Co. He is treasurer of the Salesmen's Ass'n. of the American Chemical Industry and is a member of the Chemists Club of New York.

Yee Weng Shu, U. S. Visitor

HUDSON FALLS, N. Y. — Among recent visitors in this section was Yee Weng Shu, of Shanghai, China, who spent several weeks at the plant of the Sandy Hill Iron & Brass Works, Inc., in connection with the manufacture of a papermaking machine to be shipped to China. Mr. Shu is a graduate of the oldest University in China and received his Master of Arts degree from the University of Michigan. He is to become associated in an executive capacity with the mill that purchased the papermaking machine from the local firm.

Inco Nickel at Show

NEW YORK—Inco nickel alloys will keynote the exhibit of The International Nickel Co., Inc., at the Third National Instrument Conference and Exhibits, September 13-17 at Convention Hall, Philadelphia. Instruments, where high nickel alloys such as Monel, nickel and Inconel are used for their high resistance to heat, corrosion, fatigue or other special properties, will be displayed.

U. S. Machinery for Finland

WATERTOWN, N. Y. — The Bagley & Sewall Co., Inc., manufacturer of paper and pulp-making machinery, has been busy loading two machines for shipment to Finland. The machines are designed to manufacture builder's board. Each has a width of 126 inches, is equipped with seven cylinders, operates at a speed of 450 feet per minute and has a capacity of 100 metric tons per 24 hours.

Gum Rosin Output Climbing

WASHINGTON—Gum rosin production for the first quarter of the 1948-49 naval stores year, April-June, 1948, totaled 271,800 drums of 520 pounds net, 15 percent above that reported for the same period a year earlier, according to the Bureau of Agricultural Economics on August 20.

On June 30, 1948, gum rosin stocks were reported at 268,390 drums, compared with 155,149 drums a year earlier. Wood rosin on hand June 30, 1948, was reported at 132,780 drums, compared to 87,937 drums a year earlier. From March 31 to June 30, 1948, wood rosin stocks increased 16,890 drums, where last year between the same dates, there was a drop of 7,480 drums.

Combined stocks of both gum and wood rosin on June 30, 1948, were reported at 401,170 drums, or 65 percent above those of a year earlier. Rosin stocks increased 123,190 drums during the April-June, 1948 quarter, compared with gain of 20,385 drums a year ago.

Total disappearance of rosin, gum and wood combined, in the April-June quarter is calculated at 336,839 drums, compared with 358,817 drums for the quarter ended March 31, 1948, and 378,265 drums in the quarter ended June 30, 1947. Reports by industrial consumers show increased use for adhesives, plastics, paper size, and a number of other categories, with decreased uses in chemicals ester gum, synthetic resins and others more than offsetting the gains.

During the April - June quarter exports of both gum and wood rosin were less than for a year ago. Gum rosin exports for the quarter this year totaled 57,898 drums, or 2,000 below the same period last year. Exports of wood rosin amounted to 49,252 drums or 19,500 under those in the same quarter of 1947, a drop of 28 percent.

Tall Oil Demand Zooming

WASHINGTON — Continued gains in use of tall oil by paint, varnish, linoleum and soap manufacturers, is reported by the Bureau of Agricultural Economics in an analysis of the fats and oils outlook issued August 21.

"Scarcity of fats and oils during the war greatly increased the demand for tall oil for use in soap manufacture," the agency reported, adding that its use in the other products named has continued to increase since the war. The estimated use of this oil in paints, varnishes and floor coverings was only about 2,000,000 pounds in 1943, but increased to 32,000,000 in 1947, it was pointed out.

In its estimate of naval stores production for the April-June 1948 quarter, the same agency estimated factory production of crude tall oil at 64,294,000 pounds, and factory consumption, 43,586,000 pounds, with stocks at factory and warehouses at 107,017,000 pounds; and for refined tall oil, factory production was estimated at 24,364,000 pounds; use, 14,524,000, and stocks on June 30, 37,004,000 pounds, respectively.

Employment Shows Gains

WASHINGTON — Increases in the labor force for paper and pulp was 4.6 per 100 employes in June, compared with 3.5 for May, the Labor Department reported August 19.

For paper boxes, employment increased 5.1 per 100 compared with 3.4 in May.

Says Idle Mills Cramp Newsprint

MONTREAL — Idle capacity of existing newsprint making facilities is largely to blame for the shortage of newsprint in many countries, J. M. Savage, secretary of the Newsprint A'ssn. of Canada, said on August 18.

Mr. Savage arrived here from a ten-day conference in Paris where he was elected chairman of the Press Sub-Commission of the United Nations Economic and Social Council Commission on Technical Needs of Mass Communication.

"The Press Sub - Commission feels that top priority should be given to getting this idle capacity back into full operation," Mr. Savage said.

He added that the Sub-Commission recommended to the United Nations Educational, Social and Cultural Organization that "top priority be given to production of newsprint by the nations of the world. It was further recommended that UNESCO should continue to draw the attention of international bodies to the prime importance of newsprint and to the prevention of directing pulpwood to other uses."

Name "Big Swede's" Twin

RHINELANDER, Wis. — The Rhinelander Paper Co. is running a contest to name its new paper machine now nearing completion and scheduled to be in operation early next month. The machine is a twin of the "Big Swede" installed just prior to World War II. It will produce glassine and grease-proof papers.

The contest is being carried in *Time, Modern Packaging, Packaging Parade, Food Field Reporter* and *Food Industries.* In addition, direct mail material is being sent customers and prospects. Contest closes September 1st.

United States Imports and Exports

Pulpwood, Wood Pulp, Paper, Paperboard and Paper Products

May, June and First Six Months of 1948

WASHINGTON — United States imports of pulpwood, wood pulp and newsprint increased substantially in the first six months of 1948 over corresponding imports in the first half of 1947, the Department of Commerce reported through the Office of International Trade on August 16.

United States exports of these commodities in the first six months of 1948 were generally below exports in the corresponding period of 1947. Increases were registered only in newsprint and in paperboard. Comparisons of the two periods prepared from basic data of the Bureau of the Census also showed gains in the 1948 imports of waste fibrous materials, paper, paperboard, and paper products.

Pulpwood imports in the first six months of 1948 were 926,270 cords, a gain of 200,148 cords over imports in the corresponding period in 1947; wood pulp imports were 1,201,734 short tons, an increase of 179,045; imports of waste fibrous materials were 51,092 tons, an increase of 16,584; newsprint imports totaled 2,105,657 tons, an increase of 235,227; paperboard 39,348 tons, or 10,657 more than last year; paper 2,159,900 tons, or 237,315 more; and paper products 3,212 tons, an increase of 491 tons over the corresponding 1947 figure.

United States exports of newsprint

(Continued on page 41)

(In Short Tons, Except Where Otherwise Noted)

IMPORTS

Item	May	June	1st 6 Mo.
Pulpwood, total (in cords of 128 cu. ft.)	135,261	245,884	926,270
Rough	60,633	130,579	381,659
Peeled	65,618	107,657	500,010
Rossed	193	73	500
Chipped	8,817	7,575	44,101
Wood pulp, total	205,959	213,200	1,201,734
Bleached sulphite, rayon and special chemical grades	21,810	23,417	122,063
Bleached sulphite, other	28,764	29,073	161,635
Unbleached sulphite	65,993	60,443	386,168
Bleached sulphate	27,089	32,847	145,390
Unbleached sulphate	31,470	30,322	210,465
Soda pulp	1,795	2,542	12,268
Chemical screenings	746	917	5,373
Bleached mechanical groundwood	——	——	——
Unbleached mechanical groundwood	27,864	33,183	156,155
Mechanical groundwood screenings	428	456	2,217
Waste fibrous materials, total	8,293	9,842	51,092
Rags for paper stock	1,934	1,050	12,843
Other pulp—rag, straw, esparto, etc.	——	——	——
Other waste fibrous materials	6,359	8,337	38,249
Paper, paperboard and paper products, total	384,113	390,332	2,202,460
Paper and paperboard, total	383,625	389,796	2,199,248
Paper, total	377,823	383,356	2,159,900
Newsprint	368,133	374,845	2,105,657
Printing, and book paper, uncoated	7,409	6,959	39,843
Fine paper, total	60	51	350
Writing paper	13	9	65
Cover paper	1	(1)	1
Bristols	1	3	4
Thin paper	41	36	258
Other fine paper	4	3	22
Wrapping, bag and converting paper total	2,007	1,383	12,577
Greaseproof	(1)	1	18
Vegetable parchment	2	——	11
Kraft wrapping	1,188	561	6,243
Wrapping, except kraft	817	821	6,305
Tissue paper	181	55	1,195
Absorbent paper	2	8	45
Building paper	31	55	233
Paperboard, total	5,802	6,440	39,348
Kraft container board	——	3	604
Other container and boxboard	——	——	25
Other paperboard	3,364	3,258	22,165
Fiber insulation board	——	——	20
Wallboard	2,438	3,179	16,534
Paper products	488	526	3,212

1: Less than one-half ton.

Note: Figures are preliminary; subject to revision.

Source: Prepared in the Forest Products Branch, Office of International Trade. Data from Bureau of the Census, U. S. Department of Commerce.

EXPORTS

Item	May	June	1st 6 Mo.
Pulpwood (in cords of 128 cu. ft.)	——	——	5,334
Wood pulp, total	9,326	10,309	53,797
Bleached sulphite, rayon and special chemical grades	1,868	2,567	7,758
Bleached sulphite, other	1,098	1,846	12,761
Unbleached sulphite	5,579	3,293	28,512
Bleached sulphate	49	252	626
Unbleached sulphate	500	2,299	2,874
Soda pulp	——	——	534
Screenings and other wood pulp	232	52	732
Waste Fibrous materials, total	17,257	14,026	82,603
Overissue news	3,095	2,779	10,667
Other waste paper, including old newspapers	11,773	9,762	62,536
Rags for paper stock; valued at $50 or over per ton	430	263	2,056
Rags for paper stock; valued under $50 per ton	922	611	4,560
Other paper stock	1,037	611	2,784
Paper, paperboard and paper products, total	32,775	34,510	201,240
Paper and paperboard, total	23,688	25,662	148,233
Paper, total	13,579	13,137	87,790
Newsprint	1,800	2,645	13,614
Book paper, uncoated	3,831	3,164	24,929
Fine paper, total	4,220	3,488	25,177
Writing paper	2,572	1,989	15,781
Cover paper	62	148	635
Bristols	743	454	3,345
Cigarette paper	843	897	5,416
Wrapping, bag, and converting paper, total	2,543	1,983	15,715
Greaseproof and waterproof paper	819	751	5,218
Wrapping, except kraft	822	548	5,380
Kraft wrapping	902	684	5,117
Tissue and crepe paper	338	334	2,707
Blotting paper	193	281	1,472
Sheathing and building paper	654	1,242	4,176
Paperboard, total	10,109	12,525	60,443
Kraft container board	3,868	4,072	21,569
Other container and boxboard	688	567	3,848
Other paperboard	2,285	3,829	15,465
Fiber insulation board	1,377	2,051	10,296
Wallboard	1,891	2,006	9,265
Paper products, total	9,087	8,848	53,007
Surface-coated paper	855	1,095	7,938
Toilet paper	461	568	3,746
Paper towels and napkins	145	278	1,038
Filing folders, index cards, and other office forms	153	122	975
Papeteries	3	8	38
Wallpaper	3	33	67
Shipping sacks	1,967	1,879	9,425
Paper bags	612	531	3,320
Shipping containers	1,324	1,064	5,474
Boxes and cartons	481	272	2,560
Envelopes	92	72	493
Cash-register and adding-machine paper	78	207	2,115
Other paper and paper products	2,913	2,719	15,818

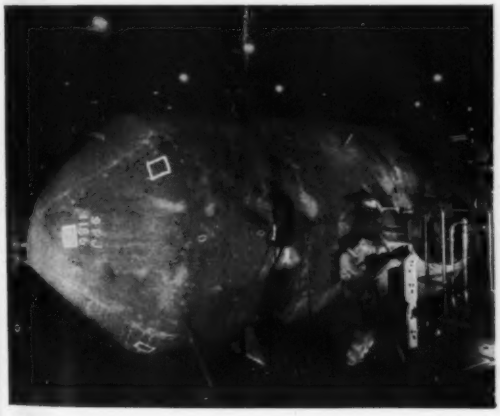
FOR PULP AND PAPER MILLS

Time-Proved Aids to Low-Cost Production

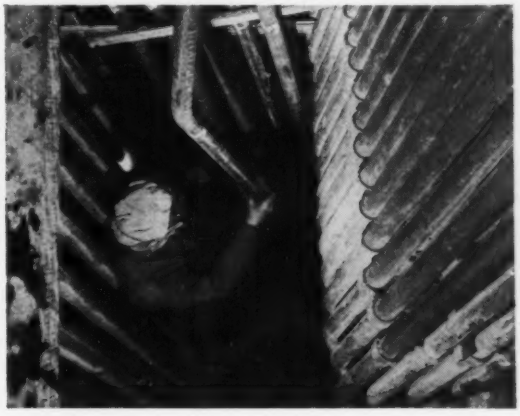
The various lines of B&W equipment shown on these pages are contributing importantly to the present high standards of operating efficiency and economy now being attained in modern pulp and paper mills. Association with progress in this industry has been a continuous story with B&W for more than 75 years.

This long period is dotted with developments pioneered by B&W in chemical recovery systems, steam generation, fuel preparation and firing methods, process equipment, tubular products—greatly aiding paper mill operations to improve plant performance and effect cost reduction.

In the future, as in the long past, this vital industry can continue to count on B&W's research and resourceful engineering to continue searching for better ways to help make paper products.



PRESSURE VESSELS—Dependable welded construction, in sizes and shapes for any paper mill requirement, can be fabricated by B&W from carbon, alloy, or clad steels. All vessels are x-ray inspected and stress relieved. Shown above is one of several 38½-ton, 30-ft. x 10¼-ft. I.D. wood pulp digesters made of Croloy-Clad Plate for a western mill.



TUBES—Seamless and Welded Tubes are made by B&W in the widest range of carbon, alloy, and stainless steel analyses available from one source. Whatever kind is needed to withstand corrosion, oxidation, contamination, creep, temperature, or pressure in paper mills—B&W makes it.

FOR PAPER MILLS—B&W-Tomlinson Recovery Units . . . B&W, Integral-Furnace, Stirling, Type H Stirling and Cross-Drum Boilers . . . Boiler Components . . . Pulverizers . . . Fuel Burning Equipment . . . Seamless & Welded Tubes for All Pressure and Mechanical Applications . . . Refractories . . . Process Equipment . . . Alloy Castings.

BABCOCK & WILCOX

THE BABCOCK & WILCOX CO.
GENERAL OFFICES: 85 LIBERTY ST., NEW YORK 6, N.Y.
WORKS: ALLIANCE AND BARBERTON, O.; AUGUSTA, GA.

Pulp and Paper Trade of Eight Nations

As reported by Forest Products Branch, Dep't. of Commerce

Republic of Panama

The only domestic production connected with the Panamanian pulp and paper industry is a factory which manufactures shoe boxes, corrugated boxes for soap, and other boxes to be used by retail stores for packing clothing. Imported paperboard is used for these items. A small amount of glazed cover paper is manufactured by this plant for use in finishing the shoe boxes.

In general, paper consumption is equivalent to imports. Imports of paper and paper products were valued at $1,682,215 in 1946 (latest data available), compared with $1,162,864 in 1945, and $1,283,517 in 1944. The 1946 imports, which represented 3 percent of total imports, are shown in table 1. The 1947 imports were expected to be approximately 10 percent higher than of the preceding year, according to trade sources.

The United States furnished a large share of the paper and paper products imports in 1946. However, Canada, Denmark, Sweden, and other European countries supplied a considerable amount of newsprint and some other types of paper. United States exports of paper and related products to the Republic of Panama in 1938 and 1947 are given in table 2. Newsprint requirements for 1948 have been estimated at 4,800 metric tons. (Report by Jeane Strawbridge, United States Embassy, Panama.)

TABLE I

Imports of Paper and Paper Products Into Panama, 1946

[Quantity in kilograms; [1] value in U. S. dollars]

Item	Quantity	Value
Kraft paper	655,813	126,655
Newsprint	2,802,813	275,004
Book paper	240,283	68,085
Cartons and pasteboard	365,750	55,331
Cardboard boxes	204,200	50,402
Drinking cups	49,938	29,956
Paper sacks	495,093	116,864
Newspapers	19,757	19,688
Books and magazines	78,206	90,514
Catalogs	131,330	187,702
Paper manufactures, n.e.s.	1,727,675	662,014
Total	6,770,858	1,682,215

[1] 1 kilogram equals 2,204 pounds.

Source: Official statistics of the Panamanian Government.

TABLE II

Exports of Paper and Related Products from the United States to Republic of Panama, 1938 and 1947

[Quantity in pounds; [1] value in U. S. dollars]

Item and Unit	1938 Quantity	1938 Value	1947 Quantity	1947 Value
Rags and paper waste	3,300	100	4,637	1,056
Newsprint	191,030	7,013	138,829	11,945
Book paper, not coated	18,964	1,196	1,769,201	306,980
Cover paper	19,117	2,205	11,516	3,617
Greaseproof and waterproof	10,393	2,049	88,673	19,088
Wrapping paper, except kraft	685,091	34,533	336,931	38,979
Kraft wrapping	170,654	8,963	158,567	23,018
Surface-coated paper	17,627	1,570	34,240	9,411
Tissue and crepe	10,640	2,234	77,560	21,718
Cigarette paper	.....	[2]	121	176
Toilet paper	196,922	14,149	494,023	73,980
Paper towels and napkins	92,245	9,364	199,521	42,649
Boxboard	136,856	3,140	27,155	3,713
Bristols and bristolboard	75,914	5,541	231,585	29,020
Paperboard, n.e.s.	159,162	7,038	211,814	31,009
Sheathing and building paper	171,507	4,474	391,167	15,243
Fiber insulation board, sq. ft.	328,681	8,184	1,634,387	70,679
Wallboard, sq. ft.	135,940	3,399	385,020	22,412
Blotting paper	4,387	756	21,388	8,360
File folders, cards, and office forms	22,521	6,811	74,329	27,742
Papeteries	6,498	1,952	11,225	6,815
Writing paper (except fancy)	699,501	52,340	193,638	45,306
Paper hangings, rolls	282	164	.....	.....
Heavy shipping bags	[3]	[3]	202,740	25,433
Other paper bags	720,203	41,671	1,045,767	161,387
Fiber boxes, heavy corrugated solid	[4]	[4]	193,832	25,698
Other boxes and cartons	134,815	12,445	220,313	38,929
Envelopes	50,771	9,591	87,406	27,750
Fiber sheets, vulcanized	274	119	18,871	3,063
Cash register and adding machine tape	8,478	789	13,977	2,047
Paper and paper products, n.e.s.	.....	38,084	471,177	172,119
Total	.....	279,874	.....	1,269,212

[1] Except as noted. [2] Included in paper and paper products, not elsewhere classified, if any. [3] Included in other paper bags, if any. [4] Included in other boxes and cartons, if any.

Source: U. S. Department of Commerce, Bureau of the Census.

Venezuela

Authorization for the duty-free entry into Venezuela of specified paper, without watermarks, for use in printing, has been extended until December 31, 1948, by Resolution No. 357 of the Venezuelan Ministry of Finance, published in the Official Gazette of May 4, 1948. This concession applies to white paper in rolls or bobbins, not calendered, without gum or sizing, weighing more than 50 grams per square meter, as classified under item No. 239 (B) of the Venezuelan customs tariff, for use exclusively in the printing of newspapers, magazines, and books of a cultural nature, and is subject to a prior authorization from the Ministry of Finance in each instance.

Although the exemption is limited to paper imported in rolls or bobbins, it also may be extended to imports of similar paper in sheets, upon the submission of satisfactory proof that it has not been possible to obtain paper in rolls under existing market conditions. (Report by E. W. Skartvedt, United States Embassy, Caracas.)

Sweden

Changes have been made in the statistical classification of specific paper items in the existing Swedish customs tariff, as published officially in February 1948. However, the tariff rates remain unchanged. The old and new classifications are shown in table 3. (Report by John B. Lynch, U. S. Embassy, Stockholm, Sweden. April 23, 1948. Recent Changes in the Swedish Customs Tariff.)

El Salvador

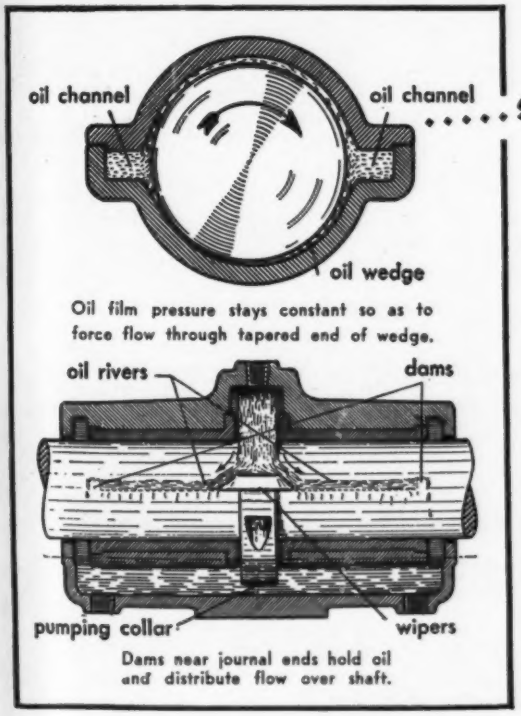
The National Legislative Assembly of El Salvador voted to reduce import duties on ordinary cardboard (carton) and lightweight boards (including bristolboard),[1] according to Legislative Decree No. 182, effective September 5, 1947. The reduction was attributed to the fact that the previous duties were regarded as so high that they constituted an obstable to the development of important industrial aspects of the domestic printing and publishing trade. Although the previous duty was established to protect the domestic cardboard industry, the present production

(Continued on page 22)

[1] Lightweight boards (cartulina), including bristolboard, are considered to be those weighing up to 350 grams per square meter; cardboard (carton) is considered as that weighing more than 350 grams per square meter.

sandy hill-cleveland type oil-film bearings

free of metallic friction


oil channel
oil channel
oil wedge
Oil film pressure stays constant so as to force flow through tapered end of wedge.
oil rivers
dams
pumping collar
wipers
Dams near journal ends hold oil and distribute flow over shaft.

. . . . . shaft floats on wedge-shaped oil film

This bearing carries heavier loads, operates at higher speed, gives uninterrupted flow of power. Out-does many ordinary bearings because it is friction-free and void of metallic contact. Bearing and shaft never touch! A flowing wedge-shaped film of oil forms a cushion on which the shaft floats free. Flow is always ample. Maintenance is minimized. Large capacity oil reservoir built in the bearing bottom seldom requires refilling.

SIMPLE OPERATION — TROUBLE-FREE PERFORMANCE

Heavy split collar elevates oil from the bearing bottom. Metal wipers distribute flow along the journals. Chamfered bearing liners permit the rotation of the shaft to force the oil past the wedge opening and under the journals. Oil collar also acts as thrust collar.

Sandy Hill
IRON & BRASS WORKS
HUDSON FALLS, N. Y.

SANDY HILL-CLEVELAND TYPE OIL FILM BEARINGS ALSO AVAILABLE IN WATER COOLED TYPES FOR ECONOMIZER, INDUCED DRAFT FAN, AND BLOWER APPLICATIONS

Eight Nations' Pulp and Paper

(Continued from page 20)

of the only factory in the country is small.

The new items and rates of duty are given below, in United States dollars per 100 gross kilograms, with old rates in parentheses:

Item No. 473-4-01-001, cardboard and lightweight boards, including bristol board, not specified, 10 (15); No. 473-4-01-002, ordinary cardboard and lightweight boards, gray (of mechanical wood pulp) and yellow (of straw pulp), lined or not with paper, 5 (15); No. 473-4-01-006, lightweight boards, including bristolboard, of chemical wood pulp, 5 (15); No. 473-4-01-007, lightweight boards, including bristolboard, of rag pulp, with or without wood cellulose, 10 (15).

The following items have been changed to read as follows (with some changes in item numbers but no change in duty):

No. 473-4-01-003, cardboard of chemical wood pulp, natural color (manila); No. 473-4-01-004, corrugated cardboard, with or without linings, especially for packing; No. 473-4-01-005, cardboard or lightweight boards, including bristolboard, lined with ordinary cloth. (Report by James Q. Ables, United States Embassy, San Salvador.)

Additional information on tariff rates of paper items are included in the Industrial Reference Service Report No. 19, Vol. 5, Part 6, published by the Department of Commerce in August 1947, and entitled "Pulp and Paper Industry, El Salvador."

India

The Government of the Province of Madras, India, recently purchased the Andhra Paper Mills, Ltd., in Rajahmundry, Madras, for $750,000, according to the Indian press. The company, which is an important supplier of paper, was forced into receivership; the Madras Government was the highest bidder. (Report by R. J. Becker, United States Consulate General, Madras.)

Portugal

Wood pulp consumption in Portugal was 20,487 metric tons in 1946, according to the Portuguese Estatistica Industrial for that year. Domestic production accounted for 5,510 tons of unbleached pulp and 10 tons of bleached (mechanical) pulp. (Other data give domestic production of pulp as 6,631 tons.) Imports accounted for 14,900 tons, as follows: Mechanical unbleached, 1,962 tons; chemical unbleached, 8,690 tons; and chemical bleached, 4,248 tons.

Other raw materials consumed in 1946 included 4,691 tons of paper clippings, 16,499 tons of old paper, 3,387 tons of rags, and 112 tons of straw.

Consumption of pulp in 1947 was estimated by the trade at 19,000 tons. Pulp production was estimated at 6,700 tons.

Paper and paperboard production totaled 39,660 tons in 1946, compared with 33,537 tons in 1945 (See WTIC, Vol. VI, Part 10, No. 9). The principal increases were reflected in paper for sacks, wrapping, printing stock and paperboard. The output comprised the following types in mertic tons: wrapping, 8,217; writing, 6,402; printing stock, 4,456; newsprint, 2,762; colored paper, 1,908; paper for sacks, 7,457; other paper, 1,968; and paperboard, 6,490.

There were 77 mills in operation in 1946, employing 3,756 workers. Paper manufacturers, faced with rising pulp prices, in 1947, petitioned the Ministry of Economy to authorize higher paper prices, but their request was refused. Consequently, factories confined their 1947 output to those types which would yield the greatest profit. Reports indicate that domestic kraft papers have improved in quality to the extent that they can compete with imported grades.

Exports of paper and paperboard (including printed books) totaled 2,019 tons, the highest in the last 10 years. Although shipments generaly go to the Colonies, France received 625 tons of printing stock and 184 tons of unspecified papers. Exports have been controlled by the Government since December 12, 1942.

Imports of paper, paperboard; and converted paper products were between 11,000 and 11,500 tons in 1946, compared with 12,023 tons in 1945. The principal imports included the following, in metric tons: newsprint and other printing, 7,637; cigarette, 430; filter, 1,647; corugated paperboard for packing, 17; telegraph tape, 29; wallpaper, 131; and carbon, 28.

Data for 1947 are not yet available, but it has been indicated that these showed an upward trend. However, this is not expected to continue in 1948, since stocks are fairly high (in May) and all imports are subject to prior authorization by the Portuguese Government, effective February 9, 1948.

United States exports of paper and paper products to Portugal in 1947 were valued at nearly $341,000, according to preliminary export data of the United States Department of Commerce. However, United States participation in this market in 1948 is expected to decrease, because of improvement in supply sources in the European area and the announced Portuguese Government policy of reducing dollar expenditures. United States exports of paper and related products to Portugal in 1947 are given in table 4. (Report by C. K. Bevilacqua, United States Embassy, Lisbon.)

Data regarding the paper industry of Portugal in 1945 and preceding years are published in World Trade in Commodities, Vol VI, Part 10, No. 9, May 1948.

(Continued on page 24)

TABLE IV

United States Exports of Paper and Related Products to Portugal, 1947

[Quantity in pounds;[1] value in U. S. dollars]

Item	Quantity	Value
Paper waste, n.e.s., except overissue newsprint	5,314	547
Newsprint	10,780	1,451
Book paper, not coated	95,972	22,356
Cover paper	37,636	12,391
Greaseproof and waterproof	18,943	10,918
Wrapping, except kraft	28,514	8,068
Kraft wrapping	10,666	2,077
Surface-coated	68,994	19,931
Cigarette paper	90,317	39,910
Tissue and crepe	300	219
Toilet	208,036	21,856
Paper towels and napkins	17,052	3,138
Bristols and bristolboard	2,416	500
Paperboard, n.e.s.	50,510	10,404
Wallboard, square feet	1,408	374
Blotting paper	58,792	8,219
File folders, cards, office forms	52,604	7,967
Writing paper, except fancy	58,534	23,204
Wallpaper, rolls	4,544	2,105
Heavy shipping bags	408,312	56,710
Other paper bags	660	315
Paper boxes and cartons, except heavy corrugated fiber boxes	988	460
Envelopes	735	305
Vulcanized fiber sheets	83,847	27,327
Cash register and adding machine tape	109,173	14,817
Paper and paper products, n.e.s.	62,939	45,212
Total	.....	340,781

[1] Except as noted.

Source: U. S. Department of Commerce, Bureau of the Census.

TABLE III

Changes in Tariff Classifications of Paper Items, Sweden

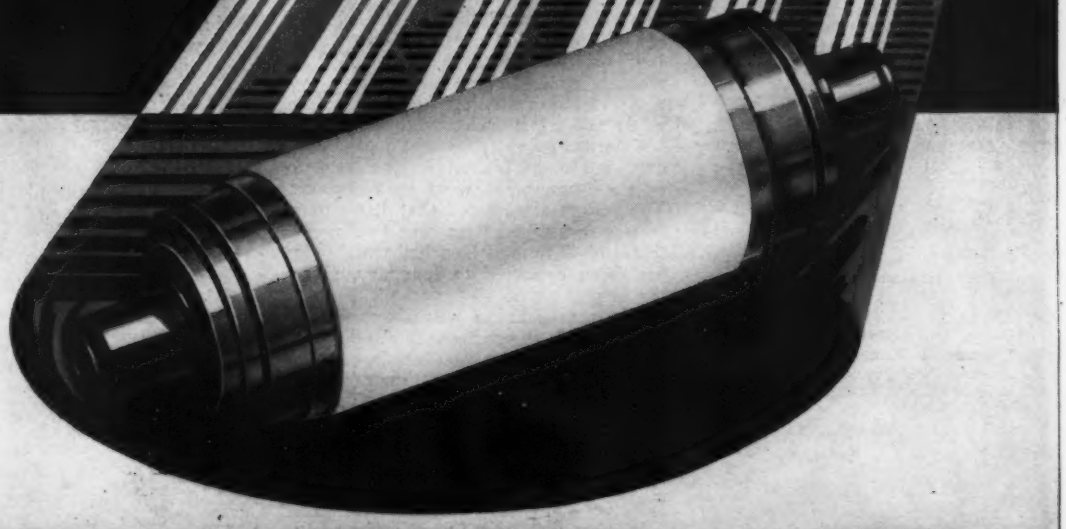
Old Classification		New Classification	
Statistical Number	Description	Statistical Number	Description
	Paper pulp:		Paper pulp:
	Of wood:		Of wood:
	Chemical:		Chemical:
	Sulphite pulp:		Sulphite pulp:
818.....	Bleached.		Bleached:
		818.1....	Dissolving pulp (viscose, high alpha, refined, and similar pulp.)
		818.2....	Other.
	Board:		Board:
			Wallboard:
835.1....	Wallboard.	834.1....	Lacquered.
		835.1....	Other.

Source: Regulations of the Swedish Customs Office.

PERKINS

DIAMOND JUBILEE

DIAMOND JUBILEE
PERKINS HOLYOKE
1873-1948



Perkins Calender Rolls are the result of the longest and broadest experience. No Calender is better than the rolls in it

B. F. PERKINS & SON, Inc.
ENGINEERS AND MANUFACTURERS
HOLYOKE, MASSACHUSETTS

Northeastern Superintendent's Program

Program of the Northeastern Division meeting of the American Pulp & Paper Mill Superintendents Ass'n., at Poland Spring House, Poland Spring, Maine, September 23-25 is as follows:

September 23

Registration and Informal Gathering.

P.M.
7:00 Dinner.
9:00 Organized Mixed Progressive Bridge Party (Contract).
9:30 Informal Dancing in Ballroom.

September 24

A.M.
9:45 General Meeting.
New Developments in Electrical and Electronic Applications to Paper Manufacture —Mr. George Knapp, General Electric Co.
10:45 (Arrangements not yet completed).
12 Noon Business Meeting (Election of Officers).

P.M.
1:00 Buffet in Grove or Diningroom.
2:00 Cost Reduction—Round-Table Discussion. (Board and Fourdrinier Groups).
3:30 Softball Game.
3:30 Ladies' Putting Contest.
3:30 Informal Golf.
7:00 Dinner.
8:30 Entertainment by Orchestra.
9:00 Distribution of Door Prizes.
9:30 Costume Party.

September 25

A.M.
9:00 Golfers' Breakfast.
10:00 Men's Golf Tournament (play anytime during day).
10:00 Horseshoe Pitching Contest.
11:30 Tug-of-War (Peddlers vs. Superintendents).

P.M.
1:00 Luncheon in Main Diningroom.
2:30 Ladies' Bridge and Tea (Contract and Auction).
3:00 Refreshments on Tenth Tee.
6:30 Cocktail Party (Get-together).
7:30 Banquet (President, Ollie Messner).
8:30 Presentation of Prizes.
9:30 Informal Dancing (Main Ballroom).
12:00 Midnight Snack.

Make your reservations as soon as possible direct to the hotel.

Following this meeting, National TAPPI and the Technical Section of the Canadian Pulp & Paper Ass'n., are jointly sponsoring a Mechanical Pulping Conference September 27-29.

It is requested that any of the members of the Superintendents Ass'n., and their affiliates desiring to remain over for the TAPPI Meeting, make their reservations for the TAPPI meeting at the same time.

Eight Nations' Pulp and Paper

(Continued from page 22)

Iraq

Exports of cigarette paper from the United States to Iraq totaled 420,558 pounds and were valued at $196,548 during 1947, compared with 741,890 pounds valued at $351,875 in 1946, and 587,135 pounds valued at $294,210 in 1945, according to United States trade statistics. There were no exports of cigarette paper to Iraq in the first quarter in 1948.

In 1948, the United States is not expected to participate to any great extent in the Iraq market for cigarette paper, partly because of the shortage of dollar exchange. Other reasons include competition from European sources and the reported preference for paper from these sources since it is regarded as more highly combustible and better suited to Iraqi tobacco than United States paper. (Reported by James D. Newton, U.S. Embassy, Baghdad.)

Rumania

Since export and import figures on Rumania trade are not published regularly and data regarding production of paper and related items are fragmentary and often conflicting, an estimate of paper consumption in Rumania is not available. However, no significant shifts in the trend of paper consumption have been noted during recent months.

A recent report (dated June 4, 1948) gives information on paper exports in 1947, as follows: According to the Rumanian press, 1,038 metric tons of newsprint and 10 tons of high-quality paper were exported to Switzerland; 504 tons of paper for school books were exported to the United States; and 254 tons of newsprint went to Hungary. The report also stated that 1,000 tons of newsprint had been sent to Argentina and 40 tons of bleached wood pulp had been exported to Hungary, since the beginning of 1948.

Paper production was about 47,800 tons in 1947, compared with 39,000 tons in 1946, according to a trade source. Paperboard output was estimated at 3,000 tons in 1947, compared with 2,500 tons in 1946.

The estimated output of wood pulp was about 35,300 metric tons during 1947, compared with 32,000 tons in 1946, according to unofficial data.

In May 1948, there were reported to be 4 wood pulp mills, 5 paper mills, and 10 paperboard plants; these had production capacities of 60,000 metric tons, 86,000 tons, and 32,000 tons, respectively. It is unlikely that full output ever has been achieved, although the prewar production was sufficient to permit some exports. Domestic production generally has been sufficient during recent years to take care of minimum needs.

An Industrial Office has been set up by the Rumanian Government to control the paper industry, the Office having the power to formulate production plans, set quotas, fix prices, allocate machinery and equipment, and direct purchases and sales. Individual plants must belong to the Industrial Office.

The outlook for United States firms to participate in the Rumanian paper trade is adverse. Imports are being kept as low as possible because of lack of foreign exchange for commercial transactions. Permits for purchases from the United States are issued only for essential items which cannot be obtained from eastern European countries.

Pulpwood Cargo Discharged

OGDENSBURG, N. Y.—The freighter Leecliffe Hall was permitted to begin discharging its cargo of 1,500 cords of pulpwood on August 12 at the upper dock of the B.D.F. Co. Unloading was not begun August 11 due to the picket lines about the struck plant thrown up August 9 by Local 211, International Brotherhood of Pulp, Sulphite and Papermill Workers.

Keeler New Marathon Executive

ROTHSCHILD, Wis.—The Marathon Corp., elected Noel E. Keeler vice-president in charge of finance and accounting on August 12. Mr. Keeler goes to Marathon from Sylvania Electric Products, Inc., New York, where for seven years he was vice-president, controller and a member of the finance committee.

Buffalo Paper Workers Vote

BUFFALO, N. Y. — Production and maintenance workers of the Hinde & Dauch Paper Company voted 48-3 on August 11 to authorize the United Paper Workers of America, CIO, to negotiate for a union shop, NLRB Regional Director Merle D. Vincent Jr., reports.

Brewer Is Jessup & Moore VP

BOSTON — John H. Brewer has become vice-president and general manager of Jessup & Moore Paper Co. Mr. Brewer was formerly general manager of the fine paper department of the Carter Rice & Co., Corp., and previously general manager of the Storrs & Bement Co.

McCarthy Co. Incorporates

OSHKOSH, Wis. — McCarthy Paper Co., recently incorporated, reported 350 shares of $100 par value common stock and 150 preferred shares at the same par value. Clifford J., Leo A., and Marvin L. McCarthy, all of this city, signed the papers.

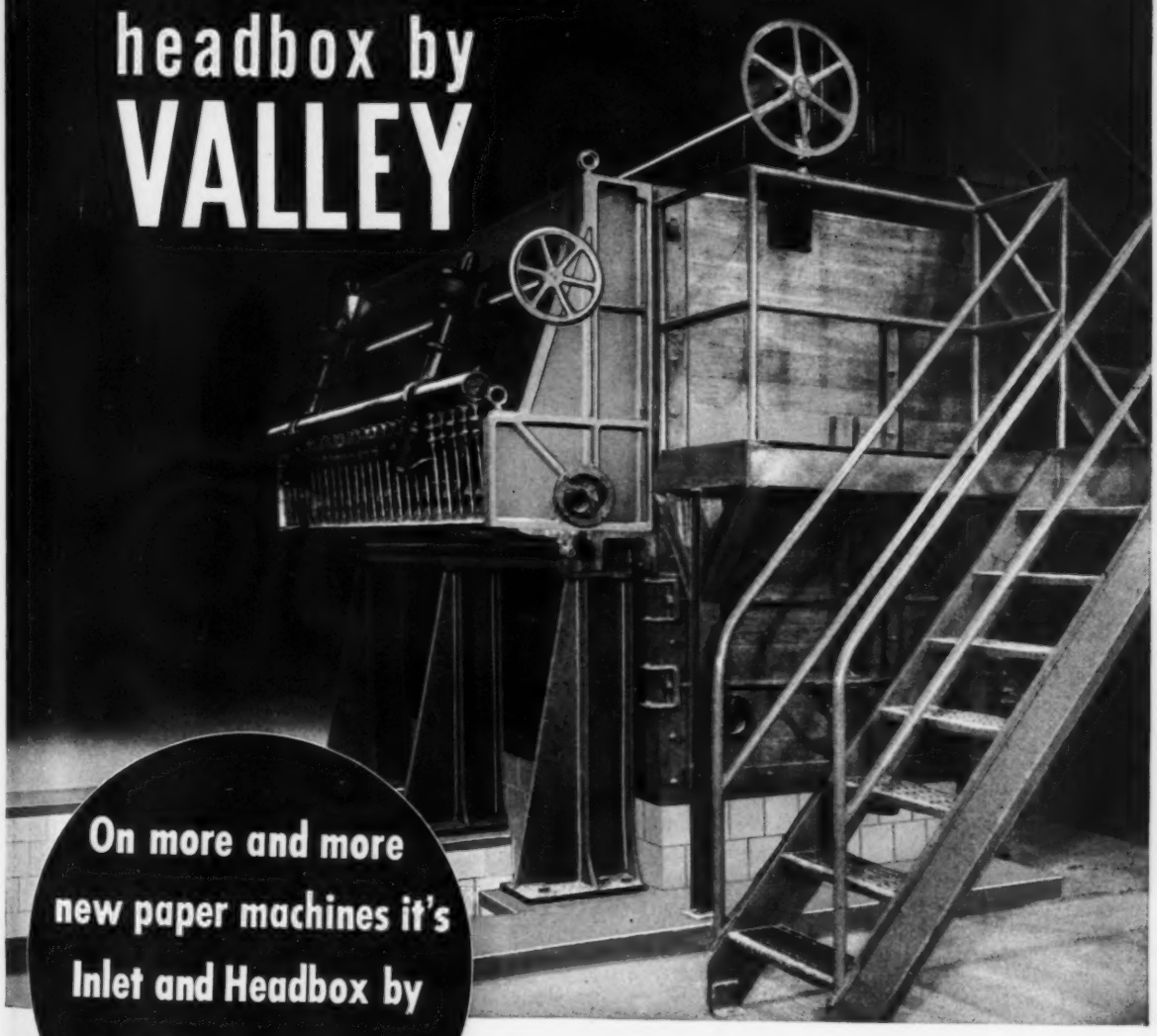
International's Leonard Retiring

TICONDEROGA, N.Y.—James Leonard, superintendent of the International Paper Co. Island Mill since 1943, has announced his retirement after almost 50 years spent in the papermaking industry.

THIS IS ON

OXFORD PAPER CO's New No. 12 Machine

. . . it's inlet and headbox by VALLEY



On more and more new paper machines it's Inlet and Headbox by VALLEY

VALLEY IRON WORKS CO.
Appleton, Wisconsin

FORMATION CALIPER LEVEL SHEET INCREASED SPEED HIGHER TEST

Annual Kalamazoo Inspection Trip

KALAMAZOO—Directors and officers of the Kalamazoo Vegetable Parchment Co., and their guests left on August 12 by train for the annual inspection of the company's properties at Espanola, Ont., Canada.

Some of the directors and guests were picked up en route and some met the party at Espanola.

Guests included Prof. A. H. White of the engineering school of the University of Michigan; Newton Halverson, Detroit partner of Ernst & Ernst; Jackson Breaks, Philadelphia, financial secretary of the Penn Mutual Life Insurance Co.; Aitken Walker, district freight agent of the Canadian Railway Co.; Senator W. H. McGuire, the company's counsel at Toronto; J. Ross Tolmic, the company's counsel on Canadian affairs at Ottawa and Dr. W. C. Clark, deputy minister of finance of the Ottawa government.

Jenkins Buys Caseyville Mill

CASEYVILLE, Ill.—The George O. Jenkins Co., of Bridgewater, Mass., recently purchased the Atlas Leather Co. mill in this city.

The mill is to be operated as the Western Fibre Co., a wholly-owned subsidiary of the Jenkins Co. This is a six machine mill which has been manufacturing shoe boards. It is planned to continue making the same products. Manager will be John E. Boyle, who has recently resigned as manager of the fibreboard mill of the Back River Power Co., Montreal, P. Q.

Kamargo Wages Upped

WATERTOWN, N. Y.—Employes of Knowlton Brothers, Inc., owner and operator of the Kamargo Mills, have been granted an increase of six cents per hour in the basic wage rate with an additional paid holiday, making a total of six such holidays per year, it was reported on August 11, by President David C. Knowlton. Under the new agreement, there will be a return to the 48-hour week.

Sidney Firm Purchased

SIDNEY, OHIO—The Sidney Paper Box & Novelty Co., has been bought by a group of Cincinnatians and incorporated under the firm style of Sidney Paper Box Co. Heading the new company are P. A. Cone, president; T. H. Cone, secretary (who is also vice-president of the General Paper Co., Cincinnati); and Edward J. Utz, Cincinnati lawyer, secretary.

Penstock Break Interrupts Power

STILLWATER, B. C.—A break in the penstock of the Powell River Co. recently gouged out deep ravines along the road and flooded the power house, causing damages to turbines and shutting off electrical power to sections of the new print plant at Powell River. Channels ploughed out of the road were 12 feet deep in some places.

AN INVITATION

to

Technical Writers

Paper Trade Journal, in the Industrial Development Section, makes space available for discussion of administrative and operaitng problems. Space is also available for presentation of independent studies and research on technical and engineering subjects. Feature stories of paper mills, converting plants and interrelated industries will also be included.

An invitation is cordially extended to all who are qualified to discuss these subjects.

Original manuscripts submitted exclusively to Paper Trade Journal and found suitable for use in this section will be paid for immediately upon acceptance. Submit manuscripts to E. P. McGinn, Industrial Editor.

Wins High Golf Honor

NEW YORK—Edward B. Vaughan of the Bulkley, Dunton Pulp Co., with his golf partner, Bill Schappa, won the John G. Anderson Memorial tournament on August 8 by defeating Ray Billows, metropolitan amateur champion, and Wesley Van Benschoten of Poughkeepsie. Rolling in a 12-foot putt for a birdie 3 that decided the match, Mr. Vaughan's feat at the Winged Foot Golf Club on August 8 was compared by the *New York Times* to that of Bobby Jones, who in 1929 on the same green holed one of about the same length to tie Al Espinosa.

Montana Pulp Operations Tour

GREAT FALLS, Mont. — Wood pulp operations on the White Sulphur Springs forest area were observed recently by Wisconsin paper companies. The Corcoran Pulpwood Co., which operates in the area, conducted a tour of the spot for representatives of the Mosinee Paper Co., Nekoosa-Edwards Paper Co., and Philmany Pulp & Paper Co. P. D. Hanson of the forest service regional office at Missoula accompanied the party.

Nichols Northern's Sales Mgr.

GREEN BAY, Wis.—Herbert L. Nichols has been named general sales manager of the Northern Paper Mills by Milan Boex, executive vice president and general manager. Nichols takes the position made vacant by Mr. Boex's promotion to head of the mill, following the death of the late A. B. Hansen.

Kuhmarker Leases New Quarters

BROOKLYN, N. Y.—The Kuhmarker Waxed Paper Co., has leased the three-story building at 185-93 Sumner avenue, corner of Kosciusko Street, Brooklyn, for ten years at a gross rental of $200,000. The firm, now at 60 Broadway, plans to occupy the building after alterations.

Crossett Increasing Facilities

CROSSETT, Ark. — K. O. Elderkin, plant manager of the Crossett Paper Mills, reports that increased production and additional facilities for mill workers will be provided by the expansion program recently started by his firm.

Mr. Elderkin said that a new Fourdrinier machine, to be in operation in early 1950, has been designed to produce lightweight kraft. Before its installation, he added, pulp facilities will be extended.

"Construction has begun on three new digesters. To be five stories high, they will be completed in November. Construction will begin in the fall to enlarge the machine room, where the new Fourdrinier will be housed.

"Also under construction and scheduled for completion in November, is the new facilities building for personnel

Tax Evaders Fined

ROCHESTER, N. Y.—Wm. J. Koester, president, and Francis A. Stevenson, vice president of the George Irish Paper Co., of Buffalo were fined today $7,500 each in United States District Court here on August 9 for income-tax evasion. They pleaded nolle contender to two counts charging them, as corporation officers, with false representation of the company's receipts in their returns filed in March, 1944, and March, 1945.

Montana Wood Contracting Begun

POLSON, Mont.—At a meeting of the board of directors of the Idaho-Montana Pulp & Paper Co., recently, it was decided to begin construction of the first unit of the firm's $15,000,000 project at the earliest possible time, and to that end, to contract for the wood now being cleared from the Hungry Horse Dam site.

Kiley Joins Flett in Boston

BOSTON—John T. Kiley, manager of O. Hodgkins & Co., waste paper dealer, has been named manager of the Boston division of the James Flett Organization, Inc., with offices at 75 Federal street. Mr. Kiley, who will assume his new duties on September 1, succeeds Miss L. G. Wonnacott.

Allen United Vice-President

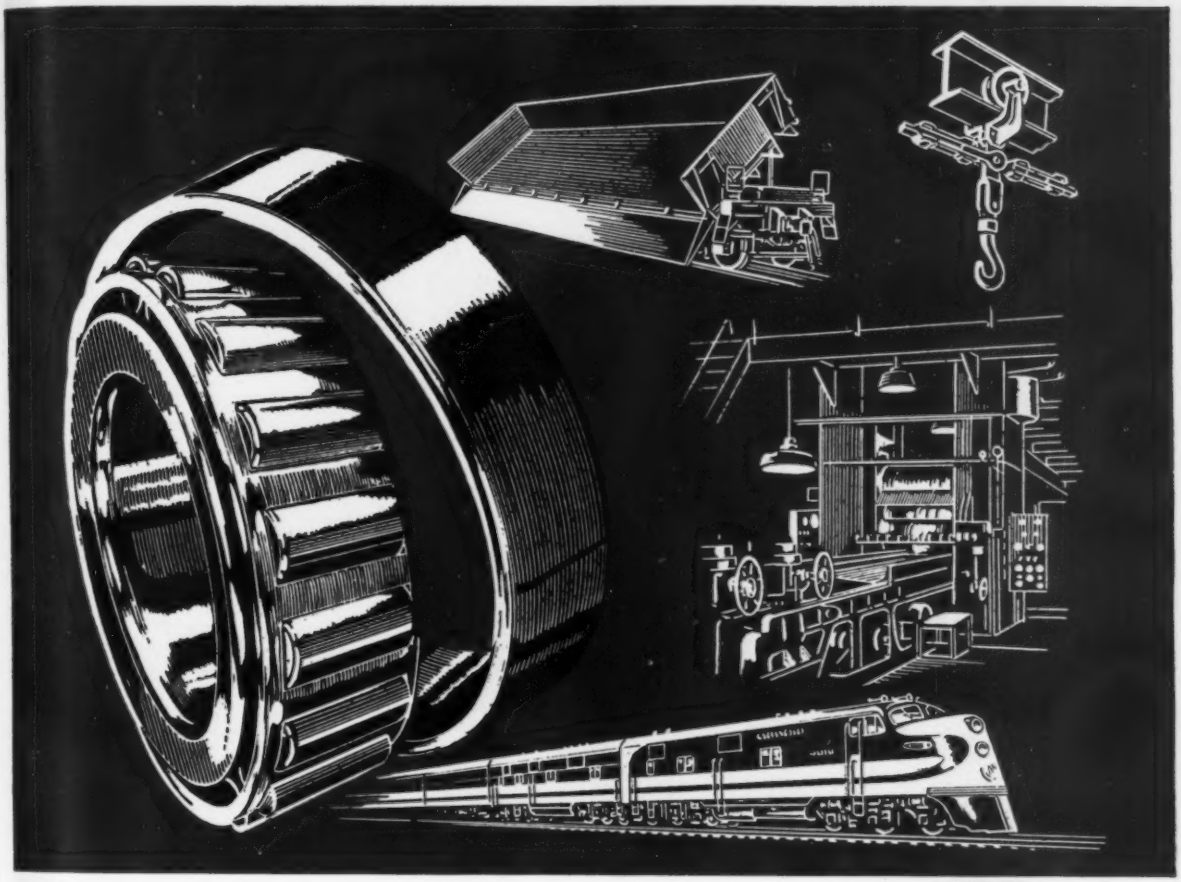
NEW YORK—William H. Allen, sales manager for cartons of the United Board & Carton Co., elected vice-president of the firm on August 11, will continue in charge of carton sales.

Mr. Allen joined the firm in August 1947. Previously he was with the Sutherland Paper Co.

Empire To Move Offices

CHICAGO — Paul Klein, executive vice-president of the Empire Box Co., on August 7 reported that the company had purchased a four-story residence on Chicago's near North side which it will convert into an office building for occupancy around October 1.

YES! Tycol Acylkup Greases perform better... BETTER... BETTER



Tycol Acylkup Greases perform better because:

... *Tycol Acylkup Greases* are made from finest quality cylinder stocks and refined neutral oils, combined with a minimum of soap.

... *Tycol Acylkup Greases* are engineered to take it. They [illegible] pe.formance.

... *Tycol Acylkup Greases* keep bearings smooth running and cool.

... *Tycol Acylkup Greases* supply the "film of protection" needed to give power a chance to produce.

Complete information on Tycol Acylkup Greases is available from your nearest Tide Water Associated Office. Write, wire, or phone today.

TYCOL
INDUSTRIAL LUBRICANTS

Boston • Charlotte, N. C.
Pittsburgh • Philadelphia
Chicago • Detroit • Tulsa
Cleveland • San Francisco

TIDE WATER ASSOCIATED OIL COMPANY
17 BATTERY PLACE · NEW YORK 4, N. Y.

LUBRICATION—"ENGINEERED TO FIT THE JOB"

FINLAND

DELIVERS HER

WOOD

PULP

MONTHLY

THROUGHOUT

THE YEAR

(NO CLOSED NAVIGATION)

PULP SALES

CORPORATION

230 Park Ave.

New York 17, N. Y.

Telephone: MUrray Hill 5-8764

TRENDS

Office of the PAPER TRADE JOURNAL,
Wednesday, August 26, 1948.

Swedish pulp prices for the immediate future are getting headline attention as a result of dollar-buying curbs recently imposed by the Swedish Government in the hope of balancing dollar outgo with dollar inflow. Since pulp sales are responsible for the bulk of dollar inflow, recent cancellations of U.S. commitments because of high Swedish prices are getting serious consideration in view of the dollar exchange unbalance. It is the opinion of one Swedish writer that worsening of the situation is a great risk.

While withdrawal of the export tax would bring some relief to U.S. pulp consumers, revaluation of Swedish currency would make their prices more competitive. Action on this revaluation, however, is not held to be likely independent of British devaluation.

Swedish sales representatives, pointing to increased production costs, officially state that it is improbable prices can take a cut in the near future. In view of the Swedish currency situation versus the position to which U.S. pulp consumers are frozen by high-priced market pulp and competitive market prices of integrated mills, reports are that some downward revision is likely in fourth quarter prices.

Waste Paper

Moderate trading characterized the waste paper market as the waning seasonal lull pointed to renewed mill buying after Labor Day.

No. 1 News alone appeared to be insufficient in supply. Director Colley S. Baker of the Eastern Conservation Committee reported that mill inventories of news grades are well under those of a year ago. He expects that during the next few weeks the mills will have to consume a part of their *news* inventories, and immediately following the Labor Day holiday the best efforts of everyone will be required to fill current mill needs and to replenish inventories. During the week ended August 14 collections supplied the mills with 83 percent of their requirements of *news* grades, though collections dropped to 98 percent of consumption during the last five weeks.

Mixed No. 1 is in moderate demand and ample supply. Mill inventories of this grade are reported well below those of 1947's period, but the mills are not using as much *mixed* as in 1947.

Books move slowly, high grades show some improvement in demand but do not use up market supply.

During the last seven weeks, consumption is reported at 6 percent below total consumption of Eastern mills during last summer's comparable period. Collections during the same period dropped about 3 percent. Old containers and high grades are reported as about half of mills' inventories.

Indexes

Index of general business activity for the week ended August 14 sloped to 149.5 from 148.5 in the preceding week, compared with 145.7 for the corresponding week of 1947.

Index of paperboard production rose to 181.4 from 176.6 in the preceding week, compared with 179.2 for the corresponding week of 1947.

Comparative ratios of U. S. paper and paperboard production to mill capacity as reported by AP&PA are shown below:

	Aug 14 1948	Aug. 7 1948	Aug. 16 1947	Aug. 17 1946	Aug. 18 1945
Paper*	96.4	†97.0	104.8	104.5	67.8
Paperboard	93.0	90.0	100.0	98.0	67.0

* Because of increases in 1948 capacity tonnage, production was greater than last year's although this year's production ratio is lower.
† Revised figure.

Paperboard Production (Tons)

	For Weeks Ended Aug. 14 1948	Aug. 7 1948	Aug. 16 1947
Production	184,342	178,326	182,090
New Orders	165,194	222,034	165,092
Unfilled Orders	375,515	395,406	470,581

Percent of Activity—Current 93%
Percent of Activity—to Date 97%

Letters

Gentlemen:

We have been subscribers to the PAPER TRADE JOURNAL for many years and have always been impressed by the authenticity of the information you give. However, we would like to question the statement in the first paragraph of *Trends* on page 28 of your issue of August 12. *Trends* says that "Unbleached kraft, soft in supply for some months, also is reported at lower figures, etc." We cannot reconcile the above statement with the fact that practically every principal paper mill in the United States has recently advanced the price of unbleached kraft paper $10.00 a ton. Also there are announcements of advances in the price of multi-wall paper shipping sacks and special paper bags.

What do you say to checking on this and giving some proper publicity to the fact that the prices of kraft papers and bags are going up along with so many other basic products?

HERBERT A. GRANT
President
Miller, Tompkins & Co.
East Rutherford, N. J.

We are particularly grateful for your letter because of the opportunity it provides us to reconcile facts which have the appearance of being incorrect.

A brief answer to your question happens to be in last week's Trends under the subhead of Coarse Papers. Putting the two related statements together, it reads: "Unbleached kraft pulp, soft in supply for some months, is reported at lower figures, $125 and $127.50, with little interest evinced in the $127.50 figure. Prices of kraft wrapping which advanced $10 a ton in July pass along increased labor, chemical and freight costs."

That the supply of kraft pulp is soft has been reported generally since January in "Paper Trade Journal," in government reports, and in other publications—when lots turned onto the market for spot cash at $140 a ton were withdrawn for con-

sumption because eager buyers did not appear. Gradually as new kraft capacity has come into production and the supply-demand reached a balance, these offers have become frequent. Most of this new production—which soon will aggregate 1,000 tons daily—is marked for integrated mill use. It is understandable that with European kraft priced on contract at $147.00 to U. S. market pulp consumers, some domestic kraft should be turned on to the market for cash. Our information is that U. S. consuming mills are "eyeing" leveling paper demand and good inventories and are not hungry for kraft pulp. Thus these spot offers have dropped from the January price of $140.00 to $125.00 with small purchasing being done at that price.

Much of this new kraft capacity is marked for multi-wall bag production with ever-widening markets, some for liner board. But when the condition of the pulp market looks ripe for turning some lots of kraft pulp into spot cash at good profit, the supply will be softened.

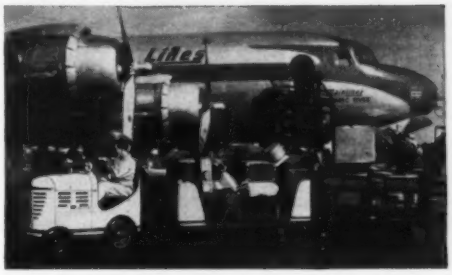
No drop in kraft contract price is likely in view of the new round of wage increases, advances in prices of all chemicals, and freight rate boosts. These advancing production costs have been passed along by kraft manufacturers in the $10.00 per ton price rise in wrapping bag, liner and corrugated, as is well known.

U. S. Imports WOODPULP

Preliminary Figures, July, 1948

	Country of Origin	Short Tons
Mechanically Ground		
Unbleached	Canada	20,036
	Finland	1,759
		21,795
Screenings	Canada	321
Bleached	No Transactions	
Chemical		
Sulphite	Canada	36,883
Unbleached	Sweden	10,874
	Finland	8,924
		56,681
Screenings	Canada	521
Sulphite, Bleached	Canada	16,879
Rayon and Sp.	Newfoundland	1,900
Chem. Gr.	Sweden	84
	Finland	377
		19,240
Other	Canada	20,111
	Sweden	3,562
	Norway	836
	Finland	4,905
		29,414
Sulphate,		
Unbleached	Canada	12,142
	Sweden	9,211
	Finland	4,654
		26,007
Sulphate,	Canada	17,943
Bleached	Sweden	8,937
		26,880
Soda, Bleached & Unbleached	Canada	2,000
Total	Canada	126,836
	Sweden	32,668
	Finland	20,619
	Norway	836
	Newfoundland	1,900
		182,859

MATERIAL HANDLING *News*



Trailer-loads of luggage, mail and express are hauled swiftly by the Clarkat to a waiting air liner.

On their way to storage a Clarkat hauls trailers loaded with castings, machined parts, drums and miscellaneous items.

Mass handling of palletized units on trailers is an easy, natural job for the Clarkat.

This compact package of pulling power "delivers the goods," at low cost

The CLARKAT

Thorough, thoughtful analysis of performance records of towing tractors used in Industry leads you inevitably to the husky, nimble Clarkat.

Hauling huge tonnages of material by the trailer-trainload—using its squared nose to bulldoze heavy units into position—handling the numerous heavy-pull jobs common to most busy plants: the Clarkat has made an extraordinary record for efficient and economical performance wherever it has been put in service.

Only an experience like Clark's—30-odd years of resourcefulness in evolving modern materials handling methods and machines—could produce the Clarkat.

Exceedingly important is the exclusive and flexible center-pivoted suspension of the full-width steering axle—a guarantee of smooth, safe travel over rough surfaces. It's easy to handle, easy on the driver, easy to steer.

It is built in two models:

- Clarkat "20"—drawbar pull 2000 pounds, towing capacity 42 tons
- Clarkat "26"—drawbar pull 2600 pounds, towing capacity 58 tons

It is gas-powered, with either solid or pneumatic tires. For still heavier hauling the Clarktor "6" is recommended; built in four models with towing capacities of 47, 68, 90 and 104 tons respectively.

A knowledge of this husky, hustling worker rates high as vital business information. To explore how it will speed up your production with substantial savings, get the objective survey and recommendation of a Clark field representative.

It's always "good business" to CONSULT CLARK.

CLARK ELECTRIC AND GAS POWERED FORK TRUCKS AND INDUSTRIAL TOWING TRACTORS

INDUSTRIAL TRUCK DIV., CLARK EQUIPMENT COMPANY BATTLE CREEK 58, MICH.
REPRESENTATIVES IN PRINCIPAL CITIES THROUGHOUT THE WORLD

IMPORTS

Week Ended August 21

NEW YORK

Newsprint

News Syndicate Co., N. O. Rogenaes, Baie Comeau, 4787 rolls.
R. A. Olsen, Newscarrier, Donnacona, 388 rolls.
Madden Reeve Angel, Tidaholm, Kotka, 1628 rolls.
R. A. Olsen, G. D. D., Donnacona, 382 rolls.
News Syndicate Co., Ted, Thorold, 1598 rolls.
R. A. Olsen, Donpaco, Donnacona, 364 rolls.
News Syndicate Co., Mimi, Thorold, 1522 rolls.
H. G. Craig Co., G. T. D., Donnacona, 318 rolls.
The Press Co., Inc., (Albany, N. Y.), Topa Topa, Antwerp, 218 rolls.
H. G. Craig Co., A. C. D., Donnacona, 350 rolls.
News Syndicate Co., Fdirljof Nansen, Dalhousie, 4893 tons.

Wallpaper

American Express Co., De Grasse, Havre, 2 cs., 1 pkge.
Cook Paint & Varnish Co. (Kansas City, Mo.), Parthia, Liverpool, 891 ctns.

Parchment

Andrews Paper Co., Queen Mary, Southampton, 1 cs. (animal).
Gerhard & Hey, Queen Mary, Southampton, 1 cs. (animal).
Stevens Nelson Paper Corp., Port Lincoln, London, 1 cs. (paper).

Wallboard

Hallman Inc., Tidaholm, Kotka, 130 crates.

Tissue Paper

B. F. Drakenfeld & Co., Parthia, Liverpool, 12 cs. (pottery); 31 cs. (gauze carbonizing).

Filter Paper

H. Reeve Angel & Co., Inc., Port Lincoln, London, 19 cs.

Gummed Paper

B. F. Drakenfeld & Co., American Clipper, Liverpool, 26 cs.

Photo Paper

American Express Co., American Chief, London, 84 cs. (base).
J. J. Gavin Co., Port Lincoln, London, 5 cs.

Napkins

(———), Mormacdawn, Copenhagen, 24 ctns.

Serviettes & Table Mats

H. W. Robinson Co., American Chief, London, 12 cs.

Miscellaneous Paper

Tice & Lynch, American Planter, Havre, 3 cs.

Rags, Baggings, etc.

Cecil Kutz, Halland, Shanghai, 100 bls. cotton waste.
E. J. Keller Co., Inc., Halland, Bombay, 200 bls. old jute rags, 220 bls. old hessian cuttings, 250 bls. old jute.
Buffalo Batt & Felt Corp., Halland, Bombay, 250 bls. cotton waste.
New England Waste Co., Halland, Bombay, 100 bls. old jute rags, 250 bls. cotton waste.
Camden Fibre Mills, Halland, Bombay, 150 bls. cotton waste.
(———), Halland, Bombay, 100 bls. old jute rags.
M. O. Schimmel, Halland, Bombay, 300 bls. cotton waste.
Lush Cotton Products Co., Halland, Bombay, 75 bls. cotton waste.
H. Adlerstein, Bernard L. Rodman, Genoa, 281 bls. dark cotton rags.
(———), Parthia, Liverpool, 42 bls. wool rags.
American Express Co., Parthia, Liverpool, 27 bls. wool rags.
(———), Exemplar, Genoa, 135 bls. hemp rags.
Manufacturers Trust Co., Exemplar, Genoa, 91 bls. old waste bagging.
National City Bank, Exemplar, Genoa, 128 bls. old waste bagging.
Manufacturers Trust Co., Port Lincoln, London, 23 bls. cotton rags.
(———), Union Victory, Antwerp, 56 bls. bagging.
National City Bank, American Clipper, Manchester, 21 bls. wool rags.
Manufacturers Trust Co., American Clipper, Manchester, 7 bls. wool rags.
D. Benedetto, Inc., Agwiking, Havana, 80 bls. rags.

Casein

Hercules Powder Co., Froste, Buenos Aires, 800 bags.
Paul A. Dunkel, Herdis, Buenos Aires, 1000 bags (lactic).

Hidecuttings

John Gorvers, Cape Cod, Barranquilla, 111 rolls.

Woodpulp Boards

National City Bank, Tidaholm, Kotka, 346 rolls, 363 bls., 286 pkgs. (solid white).

BOSTON IMPORTS

(———), Mount Mansfield, Genoa, 58 bls. hemp rags.
American Express Co., American Planter, Havre, 1 cs. paper.

CHESTER, PA., IMPORTS

Scott Paper Co., N. O. Rogenaes, Baie Comeau, 8420 bls. unbleached sulphite pulp.

PHILADELPHIA IMPORTS

National City Bank, Tidaholm, Kotka, 2159 bls. white dry mechanically ground woodpulp.
Jay Madden Corp., Tidaholm, Kotka, 452 rolls wrapping paper.
Madden Reeve Angel & Co., Tidaholm, Kotka, 696 rolls newsprint.
Darmstadt Scott & Courtney, Union Victory, Antwerp, 124 bls. jute waste.

BALTIMORE IMPORTS

Madden Reeve Angel & Co., Inc., Tidaholm, Kotka, 124 rolls newsprint.
National City Bank, Tidaholm, Kotka, 1209 bls. woodpulp.

NORFOLK IMPORTS

F. P. Gaskell Co., American Clipper, Glasgow, 66 cs. coated paper (for cigarette tips).

LOS ANGELES IMPORTS

Bank of The Manhattan Co., Mount Mansfield, Bombay, 100 bls. old jute rags.
Castle & Overton, Inc., Mount Mansfield, Bombay, 100 bls. old jute rags.
H. Adlerstein, Mount Mansfield, Genoa, 231 bls. old jute rags.

SAN FRANCISCO IMPORTS

National City Bank, Mount Mansfield, Genoa, 298 bls. dark cotton rags.
(———), Mount Mansfield, Genoa, 196 bls. old dark cotton rags.
(———), Mount Mansfield, Bombay, 321 bls. rags.

New Zealand's U. S. Imports Drop

WASHINGTON—United States paper exports to New Zealand dropped sharply in the first four months of 1948, incident to shortage of dollar exchange, latest figures indicate.

Compared with United States exports of $2,870,250 in 1947, first quarter, 1948 shipments were valued at $305,517. The principal item in these shipments was heavy corrugated fiber boxes. In 1947, the chief export items were uncoated book paper, heavy corrugated fiber boxes, writing paper, and paperboard.

Paper for wrapping and containers are factors in the New Zealand situation, it is indicated. Up to March, this year, the expected resumption of bread wrapping by bakeries and retailers failed to materialize. Paperboard containers were generally used in 1947 for butter shipments abroad, and it was estimated that between 2,000,000 and 3,000,000 such containers will be imported from the United States this year, toward the total of 3½ to 4½ million required for this purpose. Scandinavian countries were expected to supply between 1,000,000 and 1½ million, the remainder coming from domestic production.

The total newsprint imports expected to be licensed this year is 17,000 tons, of which 1947 allocations from the United Kingdom will be authorized 100 percent for 1948. United States purchases are licensed only when domestic production or United Kingdom sources cannot meet the demand for any commodity.

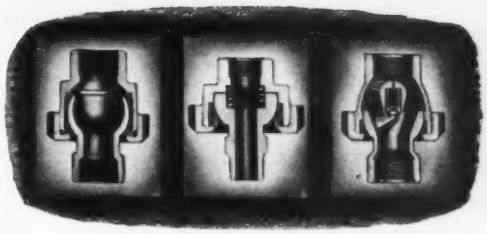
Insects Injuring Forests

TORONTO, Ont.—The lodgepole pine needle miner has been doing considerable damage in the Northern Alberta forests during the last few years. The pests have been noted in menacing numbers in the Banff area since 1942. They are tiny moths about a quarter of an inch long, very slender and have silver-grey wings. Larvae, when hatched, begin to mine the needles of pine trees during July and August. During the winter they remain dormant inside the needle, resuming feeding in the spring. Although they do not kill the trees in a single year, if permitted to thrive they ultimately denude large stands of timber. The present outbreak has reached a serious stage. By 1946 it was hoped that natural factors would have arrested the damage, but this year larvae mortality was not so high and dropped to around 20 percent. Some permanent injury to trees is reported from the Lake Louise area.

Helicopters have been used to spray the area between Banff, Alta., and Field, B. C., with DDT and Diesel oil. Three plots of 20 acres each were treated, using different spray deliveries in each section. It is understood that the spray has no effect on the larvae and must be used at just the right time to kill the matured moth and thus prevent deposit of further larvae.

Barco Flexible Joints provide labor savings and convenient flexibility and guard against breakdowns in fluid lines

In every branch of industry and transportation, you will find fluid lines equipped with Barco Flexible Joints. This is a 33-year-old record for Barco. For more complete engineering information, write to Barco Manufacturing Company, 1833 Winnemac Avenue, Chicago 40, Illinois. In Canada: The Holden Co., Ltd., Montreal, Canada.



BARCO **FLEXIBLE JOINTS**

Not just a swivel joint ...but a combination of a swivel and ball joint with rotary motion and responsive movement through every angle.

FREE ENTERPRISE—THE CORNERSTONE OF AMERICAN PROSPERITY

"MOVE IN EVERY DIRECTION"

PRICES

Quotations indicate trends in an open market. At the moment they can be of little more value. While some volume business still is done under contract at the figures shown, fluctuations are too varied and frequent to permit prices to be interpreted as representing a wholly stabilized market.

NEW YORK

Paper

(Delivered New York)

Standard News, per ton—	
Rolls, contract	$96.00/100.00
Sheets	111.00/ —
Kraft—per cwt.—Carload Quantities Zone A Deld. 40 lb. base wgt.	
Superstandard Wrapping	$9.00/ —
No. 1 Wrapping	7.25/ 8.00
Standard Wrapping	7.00/ —
Standard Bag	6.50/ —
Tissues—Per Ream 24x36 (480) 11 lbs. Zone 1.	
Wh. No. 1 Frd.	$1.84/$2.00
Wh. No. 1 M. G.	1.94/ 2.00
Wh. No. 1½	1.60/ —
Wh. No. 2	1.75/ —
Kraft Anti-Tar	1.65/ —
Kraft Unbl.	1.85/ —
Manila No. 2	1.62/ —
Shred. Wh. No. 1 cwt.	1.10/ 1.50
Toilet—Per Case of 100 rolls—1 M Sheets.	
Unbleached	$8.50/$10.00
Bleached	8.50/ 10.00
Paper Towels—Per Case of 3750—Zone 1.	
Wh. Jr. M'tif'd 9¼x9½	$5.15
Br. Sr. M'tif'd 10x12	3.60
Br. Jr. M'tif'd 9½x9¾	3.10
Br. Jr. Sgl. fold 10x10¾	3.15
Manila—per cwt.—C-1 f.a.	
No. 1 Jute Tag	$14.50/ —
Reg. Jute Manila	13.25/$15.50
No. 1 Manila	9.75/ —
5 lb. Manila	10.75/ 11.25
Boards, per ton—	
Filled News	94.00/ —
Plain Chip	90.00/ —
Blchd. Mla. L-d. Chip*	105.00/ —
White Pat. coated*	120.00/ —
Kraft Liners 42 lb.	105.00/ —
Kraft Corr. .009	110.00/ —
Binders Boards	126.00/ —

* Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following prices are representative of distributors' resale prices, all deliveries in Zone 1:

Rag Content Bonds and Ledgers—

White, 16 lb.

Bonds, per cwt.

	Carton	4 C't'n	Ton
100% Rag Ext. No. 1	$59.00	$54.55	$52.30
100% Rag	52.25	48.30	46.30
75% Rag	40.00	37.05	35.50
50% Rag	33.75	30.70	29.50
25% Rag	30.25	27.45	26.35

Ledgers, per cwt.

100% Rag Ext. No. 1	$57.00	$52.65	$50.50
100% Rag	50.25	46.40	44.50
75% Rag	40.00	37.05	35.50
50% Rag	33.75	30.70	29.50
25% Rag	30.25	27.45	26.35

Sulphite Bonds and Ledgers—

White, 16 lbs.

Bonds, per cwt.

No. 1	$21.25	$19.25	$18.50
No. 2	20.25	18.30	17.55
No. 4	19.25	17.55	16.85

Ledgers, per cwt.

No. 1	$21.75	$19.65	$18.85
No. 2	20.75	18.75	18.05
No. 4	20.00	18.10	17.35

Free Sheet Book Papers—

White, Cased Paper

	(Per cwt.) Case	Ton
No. 1 Glossy Coated	$20.40	$19.50
No. 2 Glossy Coated	19.15	18.30
No. 3 Glossy Coated	18.40	17.60
No. 1 Antique (Watermarked)	15.90	15.15
No. 2 Offset	15.15 to 17.90	14.60 to 17.10
A Grade E. F.	14.90	14.25
A Grade S. & S. C.	15.40	14.65
B Grade E. F.	13.90	13.30
B Grade S. C.	14.40	13.70

Wood Pulp

Domestic mill contract prices delivered with varying freight allowances.

	Per Short ADT
Groundwood	$80.00/$81.00
Unbleached Sulphite	124.00/ —
Bleached Sulphite	125.00/135.00
Bleached Soda	130.00/ —
Bleached Sulphate	175.00/185.00
Unbleached Sulphate Northern	125.00/155.00
Unbleached Sulphate Southern	130.00/145.00

Canadian Quotations

Prices delivered with varying freight allowances unless otherwise specified:

	Per Short ADT
Bleached Sulphate	160.00/185.00
Unbleached Sulphate	125.00/150.00
Unbleached Sulphite	125.00/126.00
Bleached Sulphite	125.00/135.00
Glassine Unbleached Sulphite (no freight allowance)	120.00/ —
Bleached Soda	130.00/ —
Groundwood	80.00/ 85.00
Sideruns Pulping News	80.00/ 90.00
Hardwood and Specialty Grades	Nominal

Swedish Quotations

On dock, Atlantic Ports

Bleached Kraft	185.00/ —
Bleached Sulphite	185.00/ —
Unbleached Sulphite	155.00/157.50
Unbleached Kraft	147.50/ —

Finnish Quotations

On dock, Atlantic Ports

	Per Short ADT
Bleached Sulphite	$187.50/ —
Unbleached Sulphite	155.00/157.00
Unbleached Sulphate	147.50/ —

New Domestic Cotton Cuttings

(F.o.b. Ship. Pt. Plus Dealer's Commission)

White Shirt	$11.50/$12.00
Unbleached Muslin	12.00/ 12.50
Light Silesias	9.00/ 9.25
White Back Blue Overalls	9.00/ 9.50
Blue Overalls	8.00/ 8.25
Fancy Shirt	6.00/ 6.25
Light Percales	8.50/ 8.75
Light Prints	7.50/ 7.75
No. 1 Washables	5.00/ 5.25
Bleachable Khaki	7.50/ 8.00
Unbleachable Khaki	6.50/ 7.00
Cottonades	5.50/ 5.75

Old Domestic Cotton Rags

(F.o.b. Ship. Pt. Plus Dealer's Commission)

	Per 100 lbs.
No. 1 Whites Repacked	$5.50/ $6.00
No. 1 Whites Miscellaneous	4.50/ 5.00
No. 2 Whites Repacked	3.50/ 3.75
No. 2 Whites Miscellaneous	3.00/ 3.50
Blue Overalls	3.75/ 4.00
Thirds and Blues Repacked	3.25/ 3.50
No. 1 Roofing Rags	1.70/ 1.80
No. 2 Roofing Rags	1.60/ 1.70
No. 3 Jute Bagging	1.50/ 1.60
No. 4 Brussels and hard back carpets	1.50/ 1.60
No. 5A Roofing Rags	1.50/ 1.60

New Foreign Cotton Cuttings

(Prices to Mill, F.o.b. Dock, N. Y.)

	Per 100 lbs.
New Dark Cuttings	$5.50/ $5.75
New Mixed Cuttings	6.25/ 6.50
Light Silesias	9.25/ 9.50
Light Flannelettes	9.25/ 9.50
New White Cuttings	12.00/ 13.00
New Unbleached Cuttings	12.25/ 13.00
Fancy Shirt Cuttings	6.50/ 7.00
Light Prints	7.75/ 8.00
Bleachable Khaki, No. 1	7.00/ 7.50
Unbl. Khaki, No. 1	6.25/ 6.75

Old Foreign Rags

(Prices to Mill, F.o.b. Dock, N. Y.)

	Per 100 lbs.
No. 1 White Linens	nominal
No. 2 White Linens	nominal
No. 3 White Linens	nominal
No. 4 White Linens	nominal
No. 1 White Cottons	8.00/ 10.00
No. 2 White Cottons	7.00/ 8.00
No. 3 White Cottons	6.00/ 6.50
No. 4 White Cottons	4.00/ 4.50
Extra Light Prints	6.50/ 7.00
Old Light Prints	4.50/ 5.00
Med. Light Prints	4.00/ 4.50
Dutch Blue Cottons	5.25/ 5.50
Checks and Blues	4.00/ 4.25
Linsey Garments	2.35/ 2.50
Dark Cottons, European	2.30/ 2.35
Dark Cottons, Egyptian	3.25/ 3.50
Old Shopperies	2.20/ 2.30
New Shopperies	2.25/ 2.30

Bagging

(Prices to Mill, f.o.b. N. Y.)

	Per 100 lbs.
Foreign Gunny, No. 1	$6.75/ $7.25
Domestic Gunny, No. 1	6.75/ 7.25
Heavy Wool Tares	6.25/ 6.50
No. 1 Scrap Baggings	5.50/ 5.75
Roofing Bagging	1.50/ 1.75
Foreign Manila Rope	6.00/ 6.75
Domestic Manila Rope	6.50/ 6.75
Jute Strings	5.00/ 5.25
No. 1 Sisal Strings	5.25/ 5.50
Mixed Strings	1.75/ 2.50

Waste Paper

Base Prices to Mills for Average Packings F.o.b. New York, Baled

	(Per Ton)
No. 1 Hd. Wh. Env. Cts., one cut	$145.00/$155.00
No. 1 Hard White Envelope Cuts	135.00/ 145.00
No. 1 Hd. Wh. Shavings, unruled	130.00/ 140.00
No. 1 Hd. Wh. Shavings ruled	100.00/ 110.00
Soft White Shavings, one cut	130.00/ 140.00
No. 1 Soft White Shavings	115.00/ 125.00
Soft White Shavings, Misc.	105.00/ 115.00
No. 1 Fly Leaf Shavings	45.00/ —
No. 1 Gd'wd Fly Leaf Shavings	35.00/ —
No. 1 Heavy Books & Magazines	21.00/ 22.00
Mixed Books	13.00/ 15.00
No. 1 White Ledger	70.00/ 75.00
Col. Ledger	45.00/ 50.00
Manila Tab. Cards	80.00/ 85.00
New Man. Env. Cuttings, one cut	100.00/ 110.00
New Manila Envelope Cuttings	65.00/ 75.00
Extra Manilas	25.00/ 30.00
Mxd Kraft, Env. & Rag Cuttings	75.00/ 85.00
Kraft Envelope Cuttings	100.00/ 110.00
Triple Sorted, No. 1 Brown Soft Kraft	65.00/ 75.00
New Kraft Corrugated Cuttings	65.00/ 70.00
No. 1 Assorted Old Kraft	40.00/ 45.00
New Jute Corrugated Cuttings	27.00/ —
Old 100% Kraft Corr. Containers	30.00/ 35.00
Old Corrugated	14.00/ 15.00
No. 1 News	10.00/ 11.00
No. 1 Mixed Papers	7.00/ 8.00
Box Board Cuttings	7.00/ 8.00
White Blank News	65.00/ 70.00
Overissue News	14.00/ 15.00
Mill Wrappers	14.00/ 16.00

Twines

All Prices Nominal, F.o.b. Mill

(Soft Fiber)	
Coarse Polished—India	.35¼/ .36½
Fine Polished Fine India	.41¾/ .45
Unpolished—Paper Makers	.32 / .35½
Tube Rope	.33¼/ .35¼
Wrapping	.37 / .39
Cotton	.63¼/ .66¾
(Hard Fiber)	
Mex. Sisal	.21 / .27
Manila (Reprocessed)	.30 / .32
(American Hemp)	
Polished Hemp	.36¾/ .60
Unpolished	.32¼/ .54

PHILADELPHIA

Domestic Rags (New)

(F.o.b. Eastern Shipping Point)

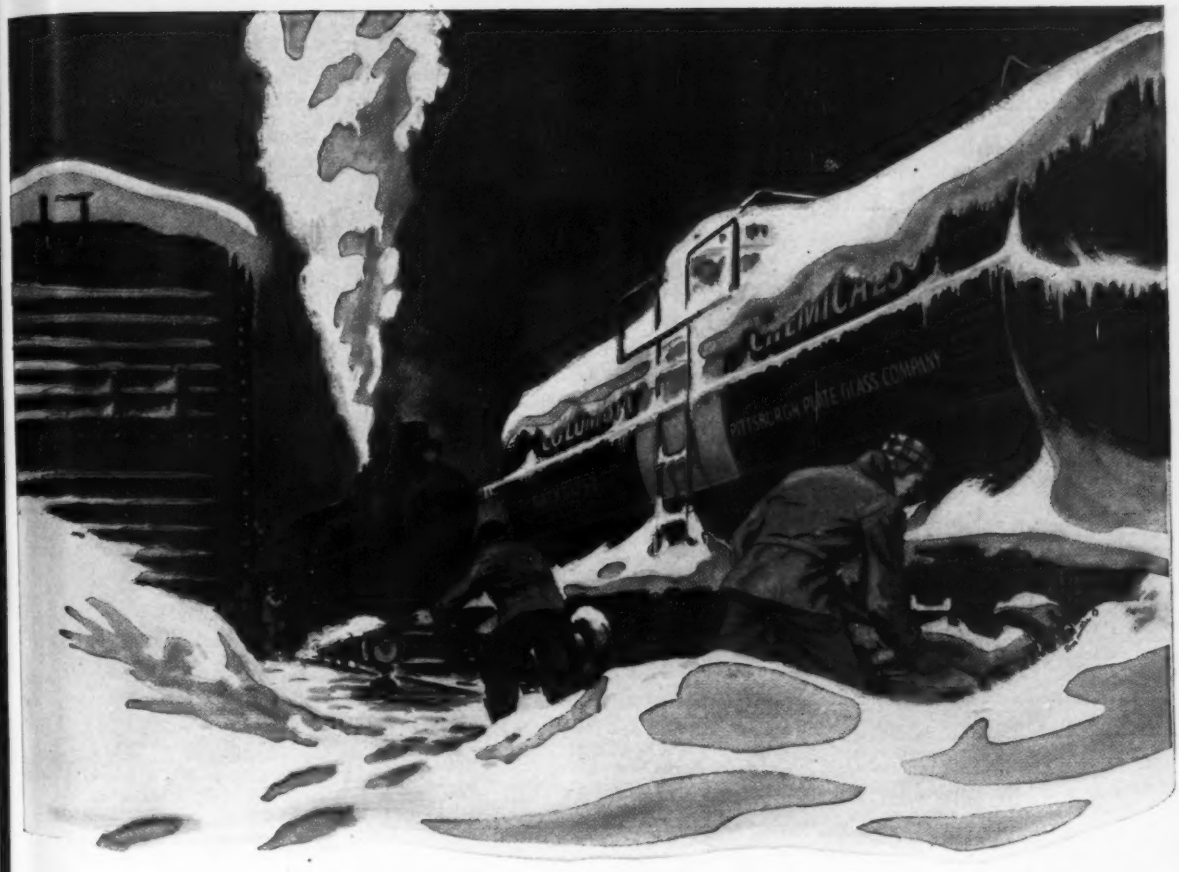
Shirt Cuttings—	
New White No. 1	.10½/ .11
New White No. 2	nominal
Light Silesias	.07½/ .08
Black Silesias, soft	.06 / .06½
New Unbleached	.10½/ .11¼
Washable Prints	.06½/ .07
Washable No. 1	.05 / .05½
Blue Overall	.07½/ .08
Cottons—According to grade—	
Washable Shredding	.03 / .03½
Fancy Percales	.06¾/ .07¼
New Black Soft	nominal
Khaki Cuttings—	
Unbleachable Cotton Cuttings	.05¾/ .06½
Bleachable Cotton Cuttings	.06½/ .07
Men's Corduroy	.05½/ .06
Ladies' Corduroy	.05 / .05½
Cottonades	.05½/ .06

Domestic Rags (Old)

(F.o.b. Eastern Shipping Point)

White No. 1—Repacked	4.50 / 5.00
Mixed White	4.00 / 4.25
White No. 2—Repacked	3.50 / 3.75
Thirds and Blues—	
Miscellaneous	2.50 / 2.75
Repacked	3.00 / 3.25
Roofing Stock—	nominal
Foreign No. 1	1.65 / 1.70
Domestic No. 1	1.55 / 1.60
Domestic No. 2	1.45 / 1.50
Roofing Bagging	— / 5.75
Old Manila Rope	

(Continued on page 36)



No Steaming Needed

—in spite of 21 days of rugged winter!

Columbia Caustic Soda Tank Car Unloaded Without Difficulty

On January 28, 1948, a Columbia Caustic Soda tank car left Barberton, Ohio, consigned to a Massachusetts plant. Heavy snow storms side-tracked the car near Buffalo. Transit time for this haul, ordinarily three to four days, stretched out to twenty-one days.

In spite of the long exposure to sub-zero weather, the temperature of the caustic liquor, loaded at 150°F., dropped only to 95°F. None of the liquor had solidified and the car was unloaded easily and completely, without steaming.

Delays of this duration are rare. The incident therefore provides unusual evidence of the highly efficient design and construction of these cars—particularly in respect to insulation—and the rigid inspection and attention given to loading temperatures.

The same care is used in the manufacture and shipping of all Columbia products. Pittsburgh Plate Glass Company, Columbia Chemical Division, Fifth Avenue at Bellefield, Pittsburgh 13, Pennsylvania.

COLUMBIA CHEMICALS

CHICAGO · NEW YORK · BOSTON · CINCINNATI · MINNEAPOLIS · CHARLOTTE · ST. LOUIS · CLEVELAND · SAN FRANCISCO · PITTSBURGH · PHILADELPHIA

PAINT · GLASS · CHEMICALS · BRUSHES · PLASTICS

PITTSBURGH PLATE GLASS COMPANY

PRICES CONTINUED FROM PAGE 34

Bagging
(F.o.b. Eastern Shipping Point)

Gunny No. 1—	
Foreign	nominal
Domestic	$5.50 / 6.00
No. 1 Clean Bright—	
Sisal Strings	.04½/ .05
No. 2 Clean Bright—	
Sisal Strings	.03½/ .04
Sisal Jute	.02¼/ .03
Scrap—	
No. 1	5.00 / 5.50
No. 2	2.50 / 3.00

Old Papers
F.o.b. Phila. Mill Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	$100.00/$115.00
No. 1 Hard White Shavings, unruled	100.00/ —
Soft White Shavings	80.00/ —
White Blank News	65.00/ 70.00
Soft White Shavings, One Cut	/ 80.00
No. 1 White Ledger	65.00/ 70.00
No. 1 Heavy Books & Magazines	20.00/ 22.00
Overissue Magazines	nominal
New Manila Envelope Cuttings	75.00/ —
No. 1 Assorted Old Kraft	35.00/ 40.00
No. 1 Mixed Paper	7.00/ 8.00
Box Board Cuttings	8.00/ 10.00
Kraft Corrugated Cuttings	75.00/ 80.00
Old Corrugated	14.00/ 16.00
Overissue News	13.00/ 15.00
No. 1 News	10.00/ 12.00

BOSTON

Old Papers
F.o.b. Phila. Mill Prices, Baled

No. 1 Hard White Shavings, unruled	$6.25 /$6.75
No. 1 Hard White Shavings, ruled	6.00 / 6.50
Soft White Shavings, Misc.	6.00 / 6.25
No. 1 Fly Leaf Shavings	— / —
No. 2 Fly Leaf Shavings	4.25 / —
No. 1 Grdwd. Fly Leaf Shvgs.	1.75 / 2.00
No. 2 Groundwood Fly Leaf Shavings	1.50 / 1.75
Mixed Colored Shavings	2.00 / 2.25
New Manila Env. Cuts, one cut	4.50/ / 4.75
Hard White Envelope Cuts, one cut	7.00 / —
Triple S'ted No. 1 Br. Soft Kraft	3.75 / 4.00
Mixed Kraft Env. & Bag Cuttings	4.00 / 4.25
Kraft Envelope Cuttings	5.00 / 5.50
No. 1 Heavy Books & Magazines	1.75 / —
New Manila Env. Cutt'gs, one cut	—/ /
New Manila Envelope Cuttings	4.00 / 4.25
White Tabulating Cards	5.00 / —
Groundwood Tabulating Cards	1.50 / 1.75
White Blank News	2.25 / 2.50
No. 1 Assorted Old Kraft	3.50 / 4.00
No. 1 Mixed Paper	.47½/ —
Overissue News	.90 / 1.00
No. 1 News	.55 / .60
Box Board Cuttings	.60 / .70
New Corrugated Cuttings, Kraft	2.75 / 3.00
Old Kraft Corrugated Containers	2.00 / 2.25
Old Corrugated Containers	— / 1.10
Jute Corrugated Cuttings	1.07½/ —
Paper Strings	2.00 / 2.25

Bagging
(F.o.b. Boston)

Gunny Bagging—	
Foreign	(nominal)
Domestic	7.00 / —
No. 1 Old Rope	6.25 / —
Mixed Strings	1.60 / —
Transmission Rope—	
Foreign	nominal
Domestic	3.00 / 3.50
Manila Rope—	
Foreign	nominal
Domestic	6.25 / —
Jute Carpet Threads	6.00 / —
Bleachery Burlap	— / 7.00
Scrap Burlap—	
Foreign	6.00 / 6.25
Domestic	6.00 / 6.25
South America	6.00 / 6.25
Wool Tares	
Foreign	6.25 / —
Domestic	6.25 / —
Austr. Wool Pouches	7.50 / —
New Zealand Wool Pouches	7.50 / —
New Burlap Cuttings	6.50 / —
Heavy Baling Bagging	5.25 / 5.75
Paper Mill Bagging	5.50 / 5.75
No. 1 Roofing Bagging	2.25 / 2.50

Domestic Rags (New)
(F.o.b. Boston)

Shirt Cuttings—	
New Light Prints	.07½/ —
Fancy Percales	.08 / —
New White No. 1	.11 / .11¼
New Light Flannelettes	.08 / .08½
Canton Flannels, Bleached	.10 / .11
Underwear Cutters, Bleached	.11½/ —
Underwear Cutters, Unbleached	.11 / .12
Silesias No. 1	.08 / .08½
New Black Silestas	.04½/ —
Red Cotton Cuttings	.05 / —
Blue Overalls	— / .08½
Soft Unbleached	.11 / .12
Blue Cheviots	.08½/ .09
Fancy	.06 / —
Washable	.06 / —
Khaki Cuttings	.06½/ .07½
Corduroy	.03½/ —
Men's Corduroy	.04 / —
Khaki Canvas	— / .06
B. V. D. Cuttings	.11½/ —

Domestic Rags (Old)
(F.o.b. Boston)

White No. 1—	
Repacked	5.00 / 5.50
Miscellaneous	4.50 / 5.00
White No. 2—	
Miscellaneous	2.65 / —
Twos and Blues, Repacked	2.75 / —
Old Blue Overalls	4.00 / 4.50
Thirds and Blues, Repacked	2.20 / —
Miscellaneous	1.80 / —
Black Stockings	3.50 / 4.00
Roofing Stock—	
No. 1	1.70 / —
No. 2	1.60 / —
No. 3	1.50 / —
No. 4	1.50 / —
No. 5, Quality A.	1.60 / —
Quality B.	1.50 / —
Quality C.	.95 / —
Old Manila Rope	6.00 / —

Foreign Rags
(F.o.b. Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper
(F.o.b. Chicago) Mill Prices, Baled

Shavings—	
No. 1 Hard White Envelope cuts, one cut	$140.00/$150.00
No. 1 Hard White Shavings, unruled	130.00/ —
No. 1 Soft White Shavings	110.00/ —
No. 1 White Ledger	60.00/ 65.00
No. 1 Heavy Books & Magazines	28.00/ 30.00
White Blank News	50.00/ 55.00
Mixed Kraft Env. & Bag Cuttings	70.00/ 90.00
No. 1 Assorted Old Kraft	25.00/ —
Overissue News	16.00/ 17.00
No. 1 News	13.00/ —
No. 1 Mixed Paper	9.00/ —
Old Corrugated	15.00/ —
Mill Wrappers	11.00/ —

MARKETS

Blanc Fixe
Market unchanged. Demand strong. Prices firm. Pulp is currently quoted at $87.00 in bags, car lots at works, 6 cents per pound, l.c.l., deld.; by-product $77.50 per ton, car lots, at works, 6 cents per pound, l.c.l., deld.

Bleaching Powder
Supply adequate. Delivery good. Shortage of shipping containers restricts export. Prices range from $4.25 to $4.50 per 100 pound drums, l.c.l. works.

Casein
Domestic supply limited, with shortage foreseen by September. Trading dull. Prices softer. Current prices on processed acid precipitated casein at 30 to 31 cents per pound for domestic grades and 26¼ to 26½ cents for imported grades, f.o.b. shipping point.

Caustic Soda
Temporary easement in supply. Liquid supply slightly improved. Solid caustic is reported at $3.10 per cwt.; flaked and ground is quoted at $3.50 per cwt. in 400 pound drums, $4 to $4.25 per cwt. in 100 pound drums—car lots at works; liquid 50 percent in tank cars at $2.50 per cwt.; liquid 73 percent in tank cars at $2.60 per cwt.; at works.

China Clay
Demand steady. Supply excellent. Domestic filled clay is $9 to $11.50 per ton, car lots; coating clay is $14 to $22. Imported clay quotation, short tons, $16 to $35, export warehouse.

Chlorine
Demand slightly easier. Supplies tight. Currently quoted at $2.40 per cwt. in single unit tank cars; at $2.70 to $3.90 per cwt., in multi-unit tank cars, f.o.b., works.

Rosin
Market steady. Prices unchanged. Buying dull. Export inquiry good. Gum rosin in drums per 100 pounds net in car lots, f.o.b. Savannah; B, $6.50; G, $7.25; H, $7.25; I, $7.26; K, $7.28. Wood rosin per 100 pounds net, car lots, f.o.b. Savannah; B, $5.00; FF, $6.50.

Rosin Size
Seventy percent gum and pale wood grades. Supply ample. Demand good. Tank cars, $6.15 to $6.25, f.o.b. southern shipping point.

Salt Cake
Demand continues ahead of supply with slight improvement in shipments. Production under contract. Domestic salt cake quoted at $25 to $28.

Soda Ash
Supply-demand near balance. Deliveries close to schedule. Export likely to expand. Current prices, car lots per 100 pounds; in bulk, $1.15; in paper bags, $1.40; and in barrels, $1.90.

Sodium Bicarbonate
Steady demand with supply good. Reported as $1.95 per cwt. paper bags, carload lots.

Starch
Trading active for immediate needs. Supply good. Record crop forecast. Prices unchanged. Pearl grade quoted at $7.00 per 100 pounds; powdered starch at $7.12 per 100 pounds; car lots, New York.

Sulphate of Alumina
Demand increased. Supply steady. The commercial grades are quoted at from $1.30 per 100 pounds, in bags, car lots, f.o.b. works. Iron free is $2.50 per 100 pounds in bags, car lots, at works.

Sulphur
Production shows heavy gain. Prices unchanged. Supplies ample. Annual contracts are quoted at $16 to $18 per long ton, f.o.b. mines; the price f.o.b. at Gulf ports is $17.50 to $19.50 per long ton.

Talc
Demand continues far in excess of supply. Prices steady. Domestic grades are currently quoted at $23 per ton in paper sacks, f.o.b. mills; Canadian at $35 and up per ton. All prices in cart lots.

Titanium Dioxide
Supply of paper grades continues unequal to demand. Shipments on allocation. Anastase 17½-18c pound carload lots, 18-19c l.c.l., rutile, 19½-20c pound carload lots, 20-21c l.c.l.; 50-pound bags, f.o.b. plant, minimum freight allowance.

Bemis Vancouver Plant Hums

VANCOUVER, Wash. — The recently completed plant of the Bemis Paper Bag Co. has reached full production and is now completely serving the territory previously served by the Bemis plant at St. Helens, Ore. During the period between closing of the St. Helens plant and reaching full production at Vancouver, Bemis supplied customers in the Northwest from its facilities at Wilmington, Calif.; San Francisco; Peoria, Ill.; and East Pepperell, Mass.

THE MEAD SALES COMPANY
230 PARK AVENUE, NEW YORK 17, N. Y.
20 NORTH WACKER DRIVE, CHICAGO 6, ILL.

MEAD
pulp

DISTRIBUTORS OF WOOD PULP
BLEACHED AND UNBLEACHED
CHEMICAL AND MECHANICAL WOOD PULP

Three Swedish, three Finnish, and three Irish lumberjacks, after two days of trying to fell a giant sequoia, had succeeded only in notching it. Paul Bunyan stood it as long as he could. Then, snorting with derision, he showed them how to fell the tree with one mighty blow!

A reproduction of this incident from the fabulous life of Paul Bunyan—the thirty-third of a series—will be sent on request. It will contain no advertising.

UNDERWRITERS
DEALERS
BROKERS

Industrial, Utility, Railroad Bonds

Preferred and Common Stocks

•

KIDDER, PEABODY & CO.

Founded 1865

Members
New York and Boston Stock Exchanges and New York Curb Exchange

NEW YORK BOSTON
PHILADELPHIA CHICAGO

Sales and Branch Offices

Albany Newport
Altoona Providence
Baltimore Reading
Lowell Scranton
Minneapolis Springfield
New Bedford Wilkes-Barre

New York Teletype NY 1-193

FINANCIAL RECORD

	Per Share Calendar Year 1947	Earnings 12 Mos. to Approx. 6/30/48	Indic. Annual Divid. Rate	Aug. 25 Closing Market Price
Preferred Stocks				
Armstrong Cork Co. $3.75 Cum.	$59.74		$3.75	94⅞
Armstrong Cork Co. $4.00 Cum. Conv.	25.85		4.00	112
Celotex Corp. 5% Cum.	24.25c	$25.99f	1.00	18¾
Champion Paper & Fibre $4.50 Cum.	65.90h		4.50	
Container Corp. of Amer. 4% Cum.	102.74	88.25	4.00	
Crown Zellerbach $4.20 Cum.	56.40h		4.20	100½
Crown Zellerbach $4.00 Cum. Conv. 2nd	211.39h		4.00	106⅞
Dixie Cup Co. $2.50 Cum. Conv. Cl. A	9.16	8.59	2.50	
Flintkote Co. $4 Cum.	81.91	80.04	4.00	101
Robert Gair Co. Inc. 6% Cum.	18.01	16.26	1.20	18½
International Paper Co. $4 Cum.	236.51	245.85	4.00	95
Johns Manville $3.50 Cum.	128.81	134.48	3.50	
Kimberly Clark Corp. 4½% Cum.	70.03	73.34	4.50	
Kimberly Clark Corp. 4% Cum. Conv. 2nd	95.88	100.73	4.00	
MacAndrews & Forbes 6% Cum.	62.20	62.56	6.00	
Mead Corp. 4¼% Cum.	81.56	79.68	4.25	91
Mead Corp. 4% Cum. Conv. 2nd	53.34	51.75	2.00	36¼
Paraffine Cos. Inc. 4% Cum. Conv.	136.19a	151.93g	4.00	
Rayonier Inc. $2 Cum.	13.58	15.44	2.00	
St. Regis Paper Co. 4.40% 1st A	76.93	84.43	4.40	
Scott Paper Co. $3.40 Cum.	43.95	50.24	3.40	
U. S. Gypsum Co. 7% Cum.	211.34	362.32	7.00	
United Wallpaper Inc. 4% Cum. Conv.	46.06a	11.13g	2.00	24
West Virginia Pulp & Paper 4½% Cum.	75.75c	78.49i	4.50	
Common Stocks				
APW Products Co.	$1.24	$1.46	$0.25	5¼
American Writing Paper Corp.	1.61	.47	0.25	
Armstrong Cork Co.	6.41		2.60	52¾
Celotex Corp.	6.59c	7.08f	1.50	29½
Certain-Teed Prods. Corp.	3.75	3.92	0.90	16½
Champion Paper & Fibre	5.57h		1.50	24½
Congoleum Nairn Co.	4.55	5.12	2.00	34½
Container Corp. of America	10.09	8.50	2.00	36⅛
Crown Zellerbach	6.81h		2.00	28⅝
Dixie Cup Co.	5.87	5.37	1.00	
Flintkote Co.	6.27	5.83	2.50	33¾
Robert Gair Co. Inc.	2.83	2.59	0.40	8
Great Northern Paper Co.	4.56	4.44	2.40	38¼
International Paper Co.	15.02	15.62	4.00	59⅛
Johns-Manville Corp.	3.17	3.28	1.40	36½
Kimberly-Clark Corp.	4.29	4.52	1.40	21⅞
MacAndrews & Forbes Co.	3.68	3.70	2.50	
Marathon Corp.	3.39c	3.93i	1.40	22⅝
Mead Corp.	7.33	7.10	2.00	18¼
National Container Corp.	4.13	3.11g	1.20	10¾
Paraffine Cos. Inc.	2.14a	2.39g	1.20	
Rayonier, Inc.	7.30	8.47	1.00	32⅛
Ruberoid Co.	10.88	12.13	2.75	62¾
St. Regis Paper Co.	2.66	2.87	0.60e	11⅝
Scott Paper Co.	3.02	3.49	2.20	46
Sutherland Paper Co.	6.87	6.56	2.50	
Taggart Corp.	1.29		0.60	
Union Bag & Paper Corp.	7.93	8.35	3.00	34¼
United Board & Carton	5.11b	4.92f	1.00	
U. S. Gypsum Co.	10.00	12.49	4.00	107
United Wallpaper	1.46a	0.28g	——	4
West Virginia Pulp & Paper	11.40c	11.56i	3.00	

(a) Year ended 6/30/47
(b) Year ended 5/30/47
(c) Year ended October 31, 1947
(e) Plus extras
(f) 12 Months to approximately April 30, 1948
(g) Twelve months to approximately 3/31/48
(h) Year ended April 30, 1948.
(i) 12 Months to approximately July 31, 1948

Dividends Declared

Great Lakes Paper Co. reports an operating profit of $2,472,351, nine percent higher than the 1947 figure, and a net profit of $1,055,833, which is 18.8 percent greater than the comparable 1947 figure of $888,951, for the first six months of 1948. Net profit for the first six months of 1948 is equivalent to $5.35 on the combined Class A and B shares (97,265 A and 100,000 B outstanding) and to $2.19 on the 400,000 common shares outstanding ($4.44 and $1.76 respectively for same 1947 period).

First half-year: operating profit (after manufacturing costs, selling and administration expenses) $2,472,351 ($2,268,026); less interest on bonds

$106,675 and $82,075; depreciation $480,000 and $408,000; pension plan $90,843; income taxes $739,000 and $889,000; net profit $1,055,833 and $888,951. Figures subject to year-end audit.

Puget Sound Pulp & Timber Co. earned $3,082,424 net profit from operations in the first half of 1948, and $131,218 additional as net capital gain, these results comparing with $2,138,016 net profit from operations and $131,218 net capital gain in the first six months of 1947. These operating profits were equal to $7.92 a share on 389,094 shares of common stock outstanding in the 1948 period, and $6.19 a share on 340,711 shares outstanding June 30, 1947. Capital gains added 34 cents a share to this year's earnings and 39 cents a share to last year's. Operating at capacity, the pulp plant produced 65,473 tons in the first half of this year, against 53,546 tons in the comparable 1947 period. Net sales and other income amounted to $10,332,274, against $6,922,031 in last year's first half.

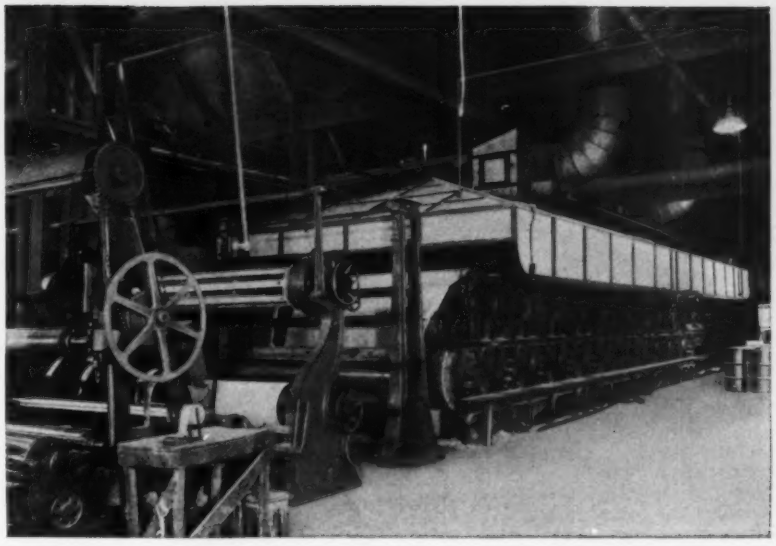
Powell River Co. reports an all-time earning record in its semi-annual financial statement. Six months' net profit was $3,400,086 or $2.53 a share, compared with $3,068,106 or $2.28 per share in the same period of 1947. Dividends during the period totaled $1.30 per share as against $1.15 for 1947's period. Newsprint production was reported as 120,143 tons compared with 118,814 for the first half of 1947.

Rayonier, Inc., for the six months ended June 30, 1948, showed sales of $31,482,386 and net income of $5,012,251, representing $4.41 per share earnings on common stock. This compares with sales of $24,109,208 and net income of $3,845,080, or $3.24 a share, for the first six months of 1947.

Weyerhaeuser Timber Co. declared a regular dividend of 50 cents on common stock payable September 8 to shareholders of record September 1.

Ruberoid Co. reports net profit of $2,708,679, equal to $6.81 per common share, for the first six months this year. For the same period of 1947, net profit was $2,211,402, or $5.56 per share. Net sales totaled $29,461,909, compared with $25,271,672. For the quarter ended June 30 this year, net profit was $1,401,180, equal to $3.52 per share, compared with $1,134,238, or $2.65 per share, for the June quarter of 1947. Net sales totaled $15,468,403, against $13,067,528.

St. Lawrence Paper Mills Co., Ltd., declared initial dividends of $1.50 on the new $6 first cumulative preferred and 60 cents on the new $2.40 second cumulative preferred, both for the quarter ending September 30. Both dividends are payable October 30 to stock of record October 8. The company also announced that in accordance with terms of the reorganization plan, the distribution of $7.75 on the old 6 percent cumulative preferred will be made on August 25.



Drying Rolls of 78" Paper Machine in Large Eastern Paper Mill.

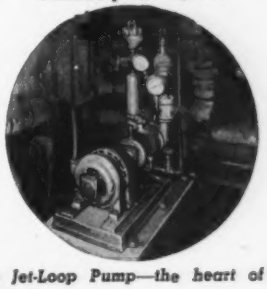
Now a Better Paper—FASTER—Through *Better* Steam Usage

NEW developments in better steam usage are doing much to improve paper quality—and to produce it at a rate of speed that is breaking all records. Maximum steam power is at last being harnessed and put to work . . . wasted energy is being recovered and utilized . . . fuel and power costs are being lowered as equipment becomes more efficient, more productive, more profitable . . .

One of the greatest developments in better steam usage is the Cochrane C-B High pressure Condensate Return System . . . a "closed circuit" high pressure condensate return system. There's no flashing of steam; condensate is returned to the boiler under high temperature and high pressure. Positive removal of condensate and insulating entrained air is insured. High uniform temperature keeps equipment at top efficiency, eliminates waste from poor drying, boosts production and effects remarkable fuel savings.

For detailed information on the Cochrane C-B System, write today for Bulletin No. 3250.

COCHRANE CORPORATION
3103 N. 17th Street
Philadelphia 32, Pa.



The Jet-Loop Pump—the heart of the C-B System.

COCHRANE

85 YEARS OF SERVICE

CONDENSATE C-B BOOSTER SYSTEM

OF HIGH PRESSURE, HIGH TEMPERATURE CONDENSATE RETURN

B. F. D. Co. Strike Settled

OGDENSBURG, N. Y.—The B. F. D. Co. employes' five-day strike ended Aug. 14, following a settlement reached by company officials and 350 members of Ogdensburg Local, No. 211, International Brotherhood of Sulphite and Paper Mill Workers, A. F. of L.

Wins "Highest Merit Award"

HAMILTON, Ohio — The Champion Paper & Fibre Co.'s annual report to stockholders won *Financial World's* "Highest Merit Award" in this year's competition among nearly 4,000 industrial companies, it was announced recently.

Warrensburg Mill Resumes

WARRENSBURG, N. Y. — The Warrensburg Pulp & Paper Co. resumed operations on Aug. 12 after a shutdown of several weeks. Full time operations are expected for several months ahead.

Struck Joins Payper Products Co.

MINNEAPOLIS—Carl Struck has been named sales manager of the Payper Products Co., manufacturer of envelopes, paper boxes and related items. Previously Mr. Struck was with the Paper Supply Co., and the Carpenter Paper Co.

Ft. Wayne Add to Line-Up

FT. WAYNE, Ind. — Albert C. Kanning has been elected assistant treasurer of the Ft. Wayne Corrugated Paper Co. Paul Dickmeyer, former assistant treasurer, retains his position as assistant secretary.

Allen Joins National

RANSOM, N. J. — James Allen has been named general manager of the local mill of the National Paper Corp. of Pennsylvania. He was formerly with the Johnson & Johnson Co., New Brunswick, N. J.

Texon, Inc. Buys Carew

SOUTH HADLEY FALLS, Mass. — The Carew Mfg. Co. was sold on August 18 to Texon, Inc., of Russell, Mass. The price was not revealed.

Cancell Joining St. Regis

NEW YORK—Benton R. Cancell has resigned as vice-president of the Powell River Company, Ltd., effective October 1, 1948, and on that date will rejoin the St. Regis Paper Co., Lyman A. Beeman, vice-president of the latter company, reports. Mr. Cancell is scheduled to become general manager of manufacturing of the Printing, Publication and Converting Paper Division and will make his headquarters at Deferiet, N. Y.

James E. Butler In New Post

NEW YORK—James E. Butler has been named manager of the fine paper department of the Walker-Goulard-Plehn Co..

A. V. Howland Retiring

BOSTON—A. V. Howland, of Hileston & Hollingsworth, paper manufacturer, with plant at Hyde Park and offices in Boston, is to retire on September 1.

Greenwich to Bush Terminal Area

BROOKLYN, N. Y. — The Greenwich Paper Co. has purchased a one-story building containing 50,000 square feet of space in the Bush Terminal area.

Roach Resumes Routine

BOSTON—John E. Roach, vice-president of the Fort Hill Paper Co., has returned from a two-week vacation in Vermont.

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1948		Corresponding Weeks—1947	
July 10	62.3	July 12	93.5
July 17	87.1	July 19	102.8
July 24	103.1	July 26	106.1
July 31	96.5	Aug. 2	103.9
Aug. 7 (Revised)	97.0	Aug. 9	105.1
Aug. 14	*96.4*	Aug. 16	104.8

COMPARATIVE MONTHLY SUMMARIES

1947						1948	
Jan.	102.1	May	106.2	Oct.	109.5	Jan.	100.3
Feb.	105.9	June	106.0	Nov.	109.3	Feb.	99.8
Mar.	106.1	July	93.5	Dec.	101.5	Mar.	100.8
Apr.	105.1	Aug.	104.2			Apr.	100.8
		Sept.	102.0	Year Avg.	104.3	May	‡100.4
						June	‡94.5
						July	‡*88.1*

‡ Preliminary Ratios.

COMPARATIVE YEARLY SUMMARIES

	1941	1942	1943	1944	1945	1946	1947	1948
Year to Date	94.2	93.8	88.1	87.7	87.7	99.8	103.7	97.5
Year Average	97.4	90.4	87.8	88.1	89.4	101.1	104.3	

PAPERBOARD OPERATING RATIOS†

Current Weeks—1948		Corresponding Weeks—1947	
July 10	56	July 12	76
July 17	84	July 19	97
July 24	91	July 26	99
July 31	92	Aug. 2	99
Aug. 7	90	Aug. 9	97
Aug. 14	*93*	Aug. 16	100

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1947	99	103	101	100	101	101	90	99	96	101	99	89	98
1948	99	100	102	102	100	94	*81*						

* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Association.

MEISEL MACHINERY IS HELPING IN ALL FIELDS

Cigarette **Wax** **Photographic** **Jet Propulsion**

Condenser **Grease Proof** **Snap-out Forms** **Aero-engine Parts**

MEISEL PRESS MFG. CO. **950 Dorchester Ave., Boston**

OBITUARY

Mark S. Wilder

Mark S. Wilder, 86, one of the founders of the West End Paper Co., of Carthage, N. Y., which was incorporated in 1901, with Mr. Wilder as secretary-treasurer and the late James A. Outerson as president, died August 18 at Pine Tree Point near Alexandria Bay, N. Y. In the same year the two men formed the Champion Paper Co., in Carthage. In 1905, the Diana Paper Co. was formed at Harrisville, N. Y., with Mr. Wilder as a director, and in 1907, he and his brother, Frank P. Wilder, acquired control of the business. Later Mr. Wilder formed the Remington-Martin Paper Co. He also was a leader in banking and power development in Northern New York.

Judson George Rosebush

Judson George Rosebush, 69, of Appleton, Wis., died of a heart attack in Chicago on July 31. Mr. Rosebush was one of the founders of the Inland Empire Paper Co., of Millwood, Wash., and among other interests was at one time a director of the Nekoosa Edwards Paper Co., Port Edwards, Wis., and an officer of the Northern Paper Mills, Green Bay, Wis. Interment was in Riverside cemetery, Appleton. Surviving Mr. Rosebush are his widow; a daughter, Mrs. A. W. Teller, and two sons, Judson George, Jr., and John.

John Crook Morgan

John Crook Morgan, 93, died in Detroit on August 20. Mr. Crook, who began his business career as a paper manufacturer, made and lost several fortunes. He at one time controlled large timber and pulp interests in New England and was long an advisor to Andrew Mellon on sites for water power development that spurred growth of the aluminum industry.

Jacob Grodsky

Jacob Grodsky, 82, president of the Missouri Bag Co., died at Jewish Hospital on August 10. Surviving Mr. Grodsky are two sons, Samuel E. and Maury; and four daughters, Miss Bess Grodsky, Mrs. J. H. Pollyea, Mrs. J. M. Ross and Mrs. J. B. Bronstein.

Charles G. Phillips

Charles G. Phillips, 79, who for 40 years was traffic manager of the National Folding Box Co., New Haven, Conn., died on August 20 following a protracted illness.

U. S. Imports and Exports

(Continued from page 16)

and paperboard were the only commodities under review to register increases in the first six months of 1948 over the corresponding period of 1947 with 13,614 short tons of newsprint exported in the first half of this year compared to only 11,748 tons in the first half of 1947; and in paperboard, with 60,443 tons in the 1948 period and 54,877 tons in the 1947 period. Exports of pulpwood dropped 50,025 cords from 55,359 in 1947 to only 5,334 in 1948; wood pulp dropped 9,392 short tons to 53,797; waste fibrous materials 9,774 tons to 82,603 in 1948; exports of paper were 14,639 tons lower at 87,790; and paper products lost 5,945 tons at 53,007 for the 1948 period.

A table showing the United States foreign trade in pulpwood, wood pulp, paper, paperboard, and paper products for May, June, and the first six months of 1948 appears herewith.

Portland Offices Moved

PORTLAND, Ore. — Offices of the Columbia River Paper Mills and affiliated Leadbetter interests have been moved from the old Oregonian building to the Fisher building at the corner of Southwest Fourteenth avenue and Alder street.

Involved in the move also are the Oregon Pulp & Paper Co., Leadbetter Logging & Lumber Co., Willamette Shingle Co., and Opaco Supply Co.

The old Standard Insurance building was purchased recently as a headquarters building but cannot be occupied immediately because of an unexpired lease.

WHICH OF THESE 5 PROBLEMS IS YOURS?

1. **Cooking cotton fibre for rag paper stock?** Here TRITONS 770 Concentrate and N-100 can help you. Efficient wetting agents, they remove solid soil in stocks—emulsify waxes or finishes which may be present—and aid in thorough caustic-penetration.
2. **Recovery of waste paper for re-use?** TRITON N-100 is unusually effective in de-inking and reworking the stock by cooking with caustic.
3. **Dispersing pigments or other materials in paper coatings?** TRITON N-100 efficiently disperses carbon black in the coloring of paper—levels other colors and pigments to give even shades and eliminate streaking. Useful in casein-bound coatings.
4. **Improvement in wetting of absorbent papers, tissue, toweling?** Here, again, TRITONS are useful, particularly on impregnating and wet strength grades.
5. **Washing felts?** TRITONS simplify this problem. TRITON 770 and TRITON N-100 are alkali-stable, efficient detergents, effective at low concentrations and in hard water.

These are only a few of the paper-processing jobs accomplished faster, more efficiently, less expensively with TRITONS. As wetters, dispersers, detergents and emulsifiers, this diversified family of anionic, cationic, and non-ionic surface active agents is used throughout the industry. We'll be glad to give you full information and samples. Just write . . .

Represented in South America by Cia. Rohm y Haas, S.R.L. Carlos Pellegrini 331, Buenos Aires, Argentina and agents in principal South American cities.

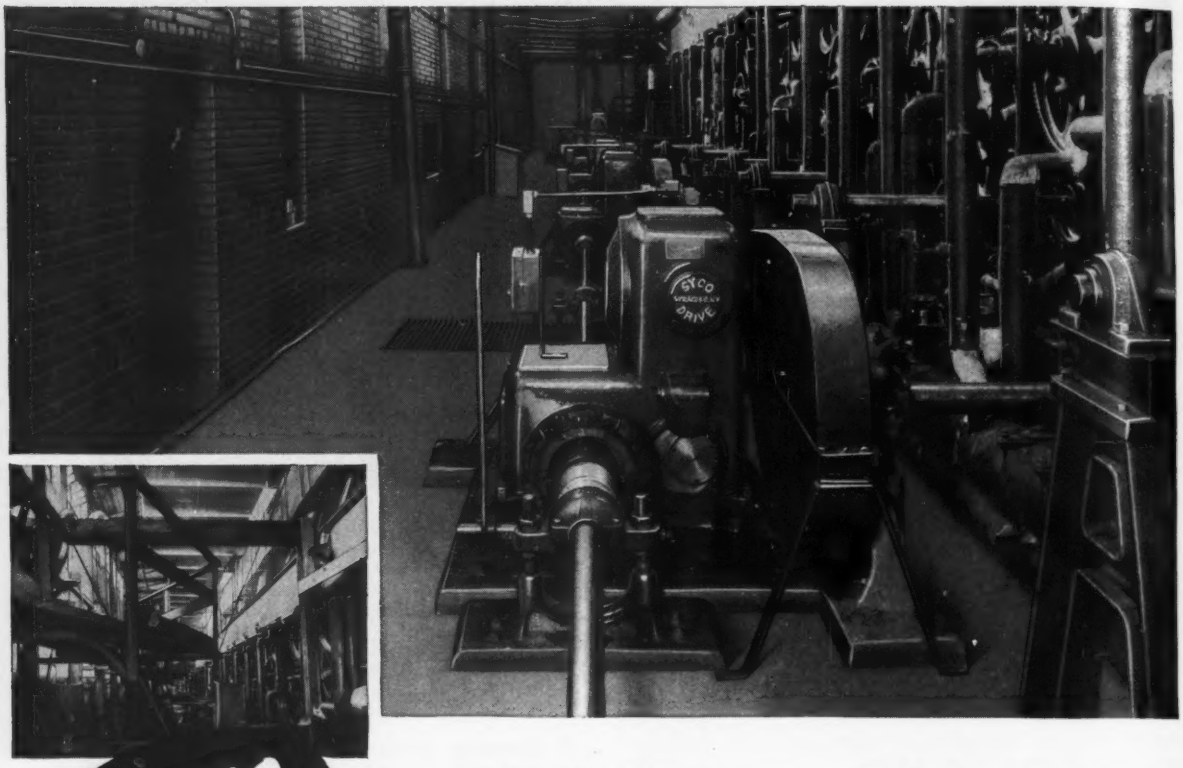
TRITON *is a trade-mark, Reg. U. S. Pat. Off.*

ROHM & HAAS COMPANY

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

Manufacturers of Chemicals including Plastics • Synthetic Insecticides • Fungicides • Enzymes • Detergents • Germicides • Chemicals for the Leather, Textile, Ceramic, Rubber, Paper, Petroleum and other Industries

Like More Floor Space Around Your Machine?



SYCO Saves Half the Space of Other Drives

The modern SYCO Paper Machine Drives save 50%, or more, of the space used by old style drives. The clean, compact, soundly-engineered SYCO Drive unit is self-contained. Just one glance at a SYCO installation reveals usable space available for auxiliary equipment — how safely accessible the paper machine is to the back-tender.

With Modern SYCO Drives, there is no drive equipment below or above the floor-level. You have a "clean" mill — uncluttered with overhead shafts, pulleys, idlers, counter-shafts and belts, guards for belts and gears, superstructure, ladders or catwalks.

Even more important is the better performance of your paper machine with SYCO Drive. The close, accurate speed control is easily adjusted — holds the individual sections in precise speed ratio — preserves uniform tension on the sheet at all times. This means smooth running, fewer interruptions — and increased production.

Write for full information on the SYCO Drives — see how readily they can be applied to your machine.

SYCO MANUFACTURING CORP., 324 West Fayette St., SYRACUSE, N.Y.

Effect of Some Manufacturing Variables on the Properties of Fiberboard Prepared from Milled Douglas-Fir*

H. Dale Turner, *Chemical Engineer;* J. P. Hohf, *Chemist, and* S. L. Schwartz, *Engineer*
Forest Products Laboratory,[1] *Forest Service, U. S. Department of Agriculture*

In the conversion of wood into fiberboard sheet materials, there are many interrelated processing variables that have a significant effect upon the quality of the final product.

This paper presents the results of tests conducted at the U. S. Forest Products Laboratory, employing three similar pulps prepared by wet grinding raw Douglas-fir. The tests included conditions affecting drainage rates, solids content of wet-pressed pulp mat, specific gravity of dried mat, and the relationship of fiberboard strength to both specific gravity and power consumption in fiber processing.

Numerous curves are presented and many of the relationships follow well-defined mathematical laws. These data, although not specifically applicable to any fiberboard process, may be of considerable use in reducing the amount of experimental work needed to evaluate techniques of pulp processing and fiberboard manufacture.

It was beyond the scope of this work to attempt a correlation of these data with operating characteristics of a production-size installation.

Introduction

In the conversion of wood into fiberboards, there are numerous manufacturing variables, other than those involved in the processes of preparation of the base pulp stock, that are known to have a significant effect upon the qualities of the final product. The effect of some of these variables on severaly closely related pulps was investigated at the U. S. Forest Products Laboratory, so that information could be made available for general use in the development of fiberboard materials from wood.

All fiberboard products discussed in this report were prepared in laboratory-size equipment. Although some of these data may be applicable to large-scale operation, no correlation with production-size equipment was attempted in this work. The relations developed, however, are useful in that they do contribute to a clearer understanding of the relative significance of several process operations commonly employed in the production of fiberboard materials. Although these data are based on a comparatively limited number of tests, the results may serve as a guide or basis of comparison for other research in this field. They may also be of aid in establishing the optimum interrelationship of processing conditions needed to produce a material conforming to certain specifications.

A paper read at the national meeting of the Forest Products Research Society, Chicago, Ill., March 22-24, 1948.

* Reprinted—Courtesy Forest Products Research Society.

[1] Maintained at Madison 5, Wisconsin, in cooperation with the University of Wisconsin.

[2] Sweeney, O. R., and Arnold, L. K.: Studies on the manufacture of insulating boards. Iowa Engineering Experiment Station, Bull. 136, 1937.

[3] Weber, C. G.: Fiber building boards. Ind. Eng. Chem. 27, No. 8, 896, Aug. 1935.

Literature

Although considerable information on the process variables operative in the forming and drying of wallboards made from wood pulps has no doubt been developed in the laboratories of manufacturers, little specific and comprehensive data have been published or disseminated.

A study of the variables involved when cornstalks were used was made by Sweeney and Arnold.[2] Another study involving the properties of over 200 materials, many of which were fibers of various sources, was made by C. D. Willson. His study, however, was more general than this report and did not relate to any particular forming process.

A closely related study, using both agricultural plant crop wastes and sawmill wood wastes for wallboards and insulating boards, was made by C. G, Weber.[3] The prime emphasis was on the fiber preparation, but some note was taken of process variables in forming the boards.

Scope

This report presents data pertinent to the manufacture of fiberboards from several pulps that were prepared at the Laboratory by wet grinding raw Douglas-fir chips in an attrition mill. The investigation included the following relationships, as determined experimentally:

1. Pulp consistency and drainage time.
2. Pulp temperature and drainage time.
3. Mixed pulp composition and drainage time.
4. Dewatering pressure and specific gravity of a subsequently oven-dried fiberboard.
5. Dewatering pressure and solids content of pressed fiber mat prior to drying.

INDUSTRIAL DEVELOPMENT

Paper Trade Journal, in this section, makes space available for discussion of administrative and operating problems. Space is also available for the presentation of independent studies and research on technical and engineering subjects. Feature stories of paper mills, converting plants and inter-related industries will be included. An invitation is cordially extended to all who are qualified to discuss these subjects. Original manuscripts submitted exclusively to Paper Trade Journal and found suitable for use in this section will be paid for immediately upon acceptance. Submit manuscripts to E. P. McGinn, Industrial Editor.

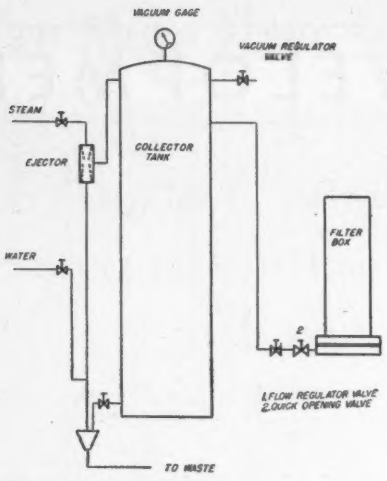


Figure 1.—Diagrammatic sketch of apparatus used in preparation of experimental fibreboards.

6. Dewatering pressure and specific gravity of fiberboard subsequently dried at several pressures.
7. Typical time-temperature curves for fiberboards press-dried at several pressures.
8. Press-platen temperature and drying time required at several pressures.
9. Sheet weight of fiberboard and drying time required at several pressures.
10. Degree of fiber refinement and specific gravity of fiberboards dried at several pressures.
11. Drying time required for fiberboards of several sheet weights and various densities.
12. Specific gravity and modulus of rupture at one moisture content.
13. Power consumption per unit weight of dry fiber produced and strength of fiberboards derived from similarly prepared pulps.
14. Comparative relationship of drainage time and strength of three similar pulps to power consumed in the preparation of the pulp.

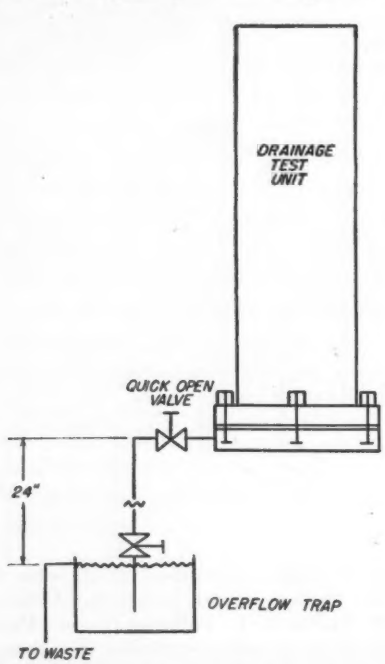


Figure 2.—Diagrammatic sketch of modified apparatus used in preparation of experimental fiberboards, showing barometric leg attachment (between quick-opening valve and overflow trap) on the filtration test unit.

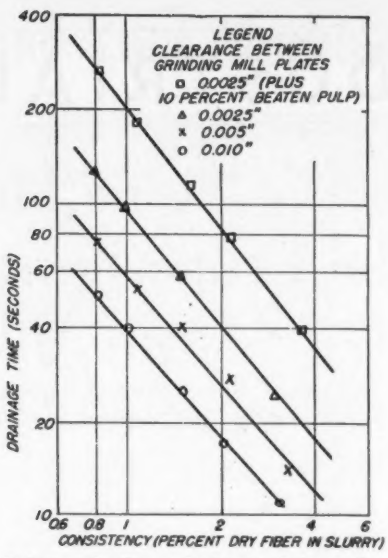


Figure 3.—Relation of pulp consistency to drainage time for several board stock pulps. All tests were conducted at approximately 17° C.

Of the foregoing relationships, many follow well-defined mathematical patterns, *i.e.*, they can be represented as straight-line plots on semi-log or log-log coordinates.

Experimental Procedure

Preparation of Pulp

In the preparation of the pulp, raw, bark-free chips of second-growth Douglas-fir were used. The chips were cut from green logs and were about 0.75 inch long in the fiber direction by 1.0 inch wide by 0.125 inch thick. Three lots of chips were milled in a 36-inch attrition mill of the double-disk type, at plate clearances of 0.010, 0.005, and 0.0025 inch, respectively. The water feed to the mill was at 15° C., and the feed rate of the chips was adjusted to develop a high-power loading on the machine. The oven-dry solids content of the discharged pulp was in the range of 8 to 10 percent.

During the course of the grinding operation, the total power consumption for each batch of chips was recorded. The actual power delivered to the grinding plates, however, is dependent on the motor efficiency, which, in turn, is related to the degree of loading. For this particular work an over-all factor of 0.85 was used as the ratio of actual power input into the wood to that measured by the power meter.

In order to simplify stock preparation and minimize possible complications in the interpretation of factors affecting board qualities, no water repellants or other chemical agents were used in preparation of these fiberboards.

Drainage Test Procedure

In the study of drainage-time relationships, a filtration test unit 9.5 inches in diameter, having an 40-mesh bronze wire screen as the filter medium was used. The pulp chest, which was readily removed from the base filter unit proper, was a cylindrical steel shell, 18 inches in height. A diagrammatic sketch of this unit and the related vacuum and collector accessories is shown in

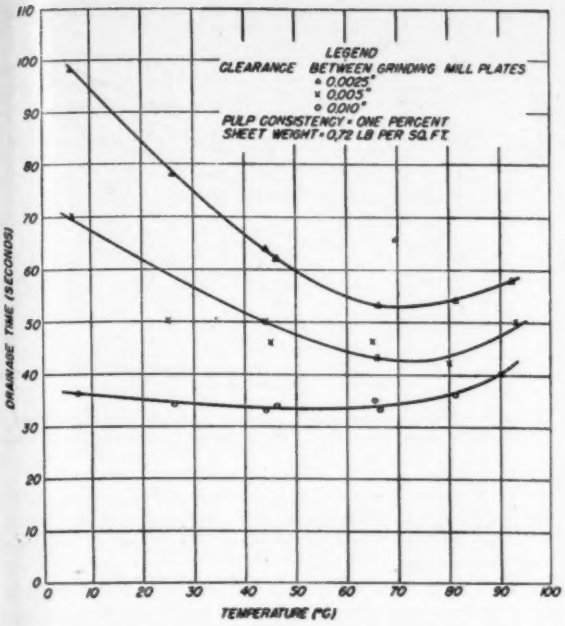


Figure 4.—Effect of temperature upon observed drainage time of several pulps when water was removed by a vacuum system of unlimited capacity.

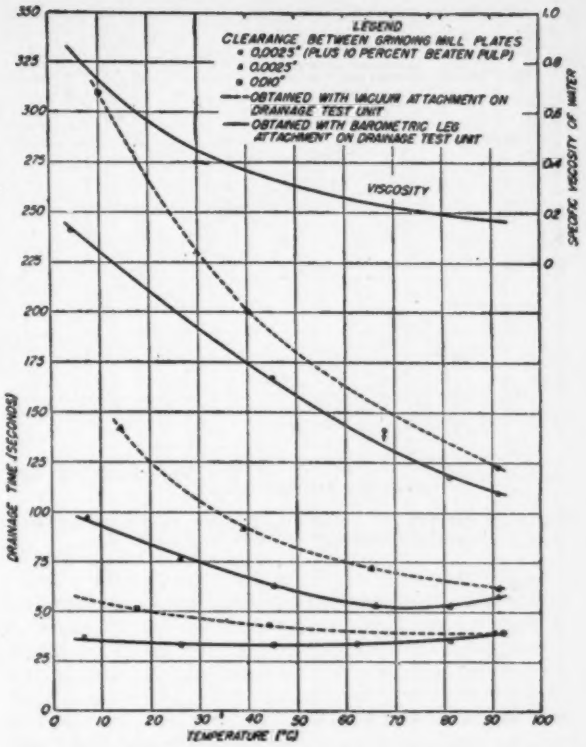

LEGEND
CLEARANCE BETWEEN GRINDING MILL PLATES
▲ 0.0025" (PLUS 10 PERCENT BEATEN PULP)
▲ 0.0025"
● 0.010"
OBTAINED WITH VACUUM ATTACHMENT ON DRAINAGE TEST UNIT
OBTAINED WITH BAROMETRIC LEG ATTACHMENT ON DRAINAGE TEST UNIT
VISCOSITY
DRAINAGE TIME (SECONDS)
SPECIFIC VISCOSITY OF WATER
TEMPERATURE (°C)

Figure 5.—Comparative drainage time of several pulps when tested by two different test methods.

Figure 1. This unit was standardized by adjusting the regulating valve so that 12.71 liters of water at a temperature of 15° C. were removed in 30 ± 0.5 seconds, when the vacuum in the adjacent collector tank was maintained at 15 inches of mercury.

Tests were performed in which consistency of the pulp stock was made the major variable, by holding the dry-sheet weight of pulp constant while the total water volume was varied. The drainage end point was arbitrarily defined as the point at which reflective water surfaces disappeared from the top area of the formed mat. Repeated trials with the same charge of pulp stock indicated a reproducibility on the order of ±2 percent.

Experiments, in which an attempt was made to determine the magnitude of segregation effect during formation of the wet mat, were conducted by diluting a well-dispersed pulp slurry to approximately 0.75 percent consistency. After agitation in the forming box, the suspension was allowed to settle freely for five minutes before the vacuum was applied to form the mat. During the settling period, no water removal was permitted and the initial drainage with vacuum was at a slow rate, so as to disturb the mat formation as little as possible.

In order to minimize the effect of a screen-dried surface insofar as possible, an 80-mesh bronze wire screen was used in the wet pressing and drying of these mats.

The study of the influence of temperature on drainage time was conducted by placing a well-dispersed pulp slurry in the test unit, then injecting steam directly into this suspension until the desired temperature was reached. The final adjustment of volume to exact consistency was done by adding water of the same temperature as that of the heated pulp suspension. The pulp slurry was then mixed and the vacuum immediately applied to form the mat.

An alternate method of operation of the drainage test unit was also briefly used in the temperature studies. The alternate system (Figure 2) consisted of a short barometric leg attached directly to the test unit and discharging into a constant-level overflow trap. The restriction was again adjusted, so as to give a 30-second drainage time for 12.71 liters of 15° C. water. The simplicity of this arrangement is rather attractive and it does obviate the flashing effect of the vacuum set-up.

Fiber Mats for Strength Tests and Press-drying Experiments

In the production of mats for strength tests and press-drying experiments, the circular filter unit was replaced

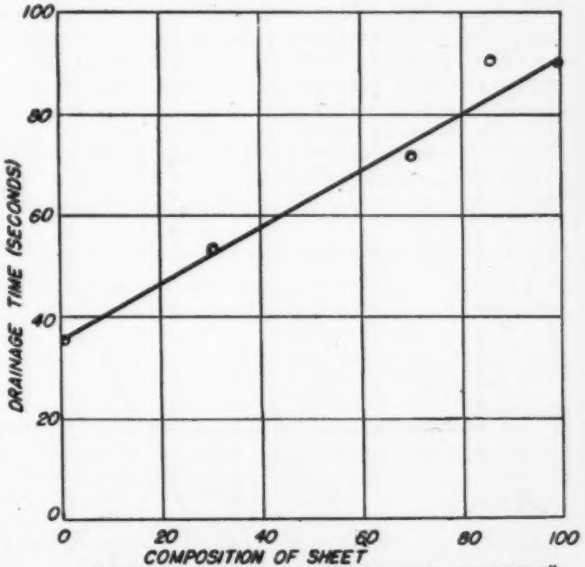

DRAINAGE TIME (SECONDS)
COMPOSITION OF SHEET
(PERCENT BY WEIGHT OF FIBER MILLED AT 0.0025"
CLEARANCE BETWEEN GRINDER PLATES)

Figure 6.—Relation of mixed mat composition to drainage time. Fractions consisted of 0.020- and 0.0025-inch milled fiber.

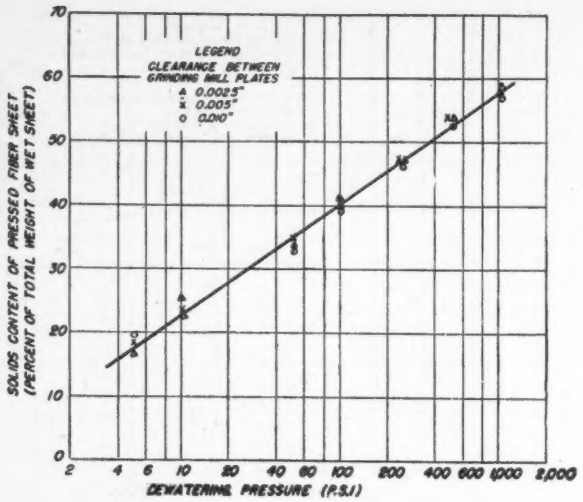

LEGEND
CLEARANCE BETWEEN GRINDING MILL PLATES
▲ 0.0025"
x 0.005"
o 0.010"
SOLIDS CONTENT OF PRESSED FIBER SHEET (PERCENT OF TOTAL WEIGHT OF WET SHEET)
DEWATERING PRESSURE (P.S.I.)

Figure 7.—Relation of dewatering pressure to solids content of pressed, wet fiber mats prepared from similar pulps.

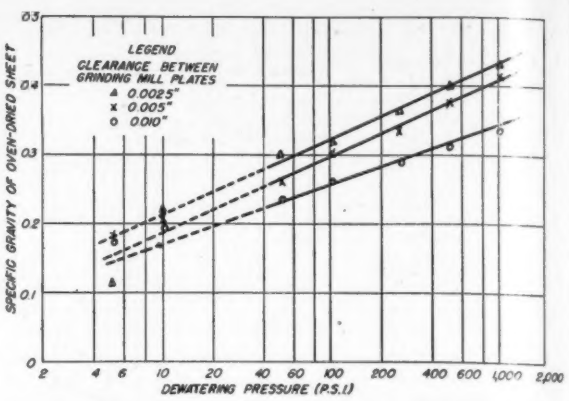


Figure 8.—Effect of dewatering pressure upon the specific gravity of subsequently overdried fiberboards obtained from three similar pulps.

with a 10-inch square forming box. The procedure used in preparation of these fiber mats was as follows: A thoroughly dispersed pulp suspension was charged into the forming box; the water volume was adjusted to give a consistency of approximately 1.50 percent, and, after brief agitation in the box to insure even pulp distribution, the mat was formed. A portion of the free water was removed mechanically from the formed mat by pressing it in a hydraulic press. The mat was first placed on a 16-mesh screen; stainless steel cauls were then put on each side, and this bundle, in turn, was placed on an 11-inch square plywood plate and then centered in a shallow steel tray which served to collect and drain the water squeezed from the mat during pressing. (This process is referred to as "wet-pressing" in this report.) The plywood plate supported the mat above the water level in the tray, so as to prevent standing water in the tray from being absorbed by the mat upon the release of pressure. The press was equipped with a manually operated valve in the hydraulic system, which permitted convenient control of the rate of ram travel and pressure development upon the compressed mat. The rate of compression is an essential factor in applying pressure to a wet fiber mat. Excessive speed causes rupturing, as the water cannot escape rapidly enough through the mat and screen, whereas extremely slow speed, although not harmful, is time consuming.

Those mats that were wet-pressed at normal temperatures were gradually compressed until the desired final pressure was attained, and this pressure was then held constant for approximately 60 seconds; the standing water along the edge of mat was blown off with a gentle air stream and pressure then released. The pressed mat was weighed to the nearest gram immediately after pressing.

In the series of mats pressed at elevated temperatures, the platen temperature was adjusted by mixing cold water and steam in the service lines to the press platens to correspond as closely as possible to the desired temperature. The mats were then prepared, using a heated pulp stock at a temperature slightly higher than that of the platen in order to compensate for heat losses during forming and transfer to the press. Just prior to placing the hot, wet mat in the press, a fine wire thermocouple was inserted at midthickness and thrust into the mat for a distance of about 1.5 inches. The temperature recorded was that indicated by the thermocouple immediately before the release of terminal pressure.

Mats that were oven-dried were placed in an electrically heated oven with forced-air circulation for a period of approximately 16 hours at 105° C. Press-dried mats had a screen placed on the lower surface and were then put between 0.125-inch stainless steel plates and dried in contact with the steam-heated platen of the press under constant pressure. The end point of the press-drying cycle was taken as the point at which no moisture was condensed on the surface of a cold, shiny metal spatula blade held momentarily near the edge of the hot mat.

To obtain the time-temperature data at the center of mats dried under several pressures, two mats of equal dry solids content were formed, and prior to wet-pressing a fine wire thermocouple laid between them. The combined wet-pressed mat with embedded thermocouple was then dried in the usual fashion, and periodic temperature measurements were made during drying.

The fiberboard specimens used in strength tests were made in duplicate and from each specimen four 1.50 inch wide by 9.50 inch long test pieces were cut. These test pieces were then conditioned for two weeks at 70° F. and 65 percent relative humidity. All test sections were broken in static pending with the screen side of the piece opposite the surface in contact with the center loading head. The rate of head movement of the testing machine gravity of test sections was based on the volume at test and weight when oven dry.

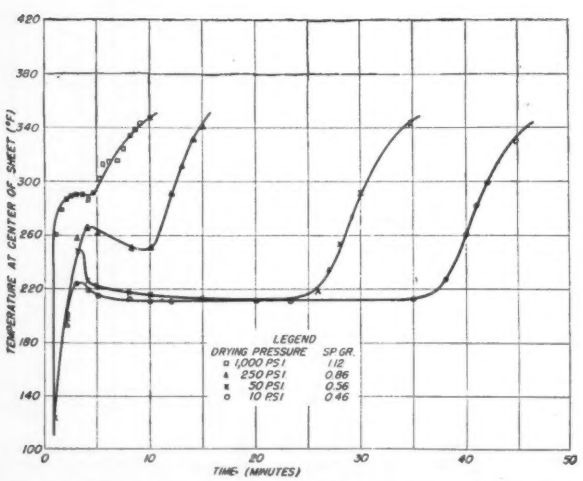


Figure 9.—Typical time-temperature relationship at midthickness of fiberboards during press drying under several pressures.

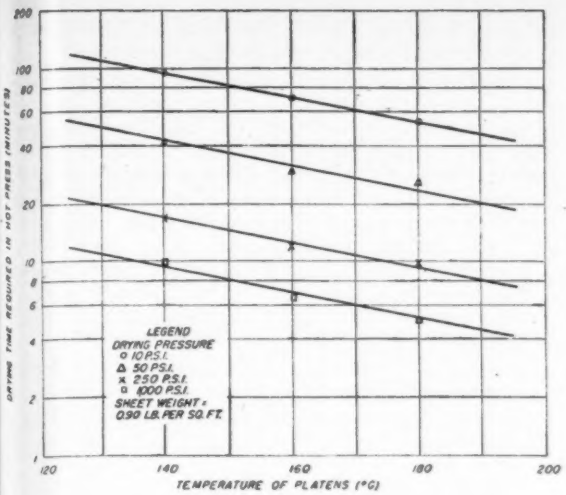


Figure 10.—Effect of platen temperature upon rate of drying of fiberboards under several pressures. These boards were preparde from 0.005-inch milled fiber.

Discussion and Presentation of Results

Factors Affecting Drainage Time

The relationship of pulp consistency to drainage time is shown in Figure 3. This correlation is well established for a large variety of pulps, and these data simply confirm this basic relationship for a rather broad range of board stock pulps. Perhaps the most significant factor illustrated here is that an increase in pulp consistency produces more than a directly proportional decrease in drainage time.

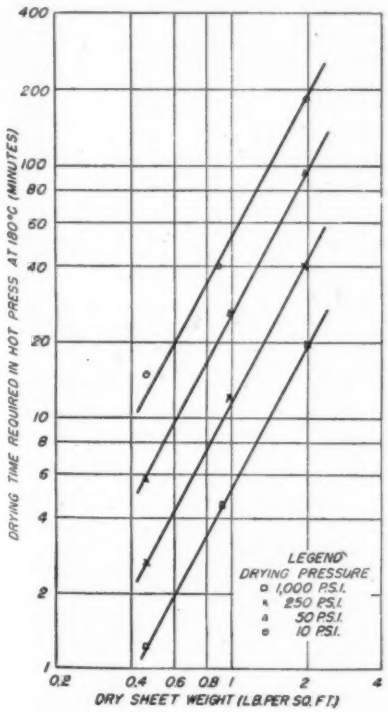


Figure 11.—Derived curves depicting the correlation of drying-time requirements at several presures for fiberboards of various sheet weights.

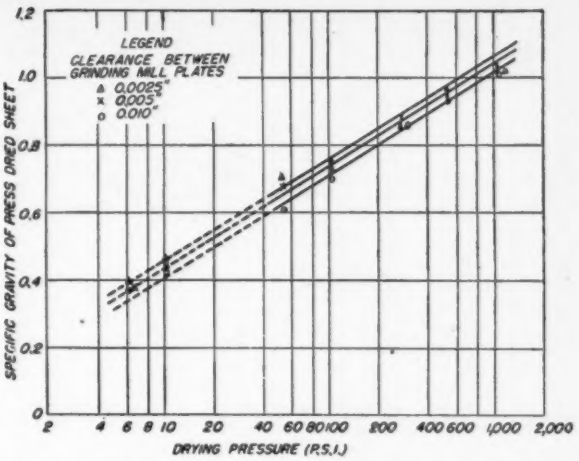


Figure 12.—Relation of drying pressure to fiberboard specific gravity.

The temperature-drainage relationships presented in Figure 4 and 5 indicated that, under certain circumstances of limited capacity in the vacuum system, the use of elevated stock temperatures may not result in reduced drainage time. This behavior was not what would normally be expected; that is, viscosity decreases with an increase in temperature and, therefore, the higher the temperature the shorter the drainage time. The cause for increased drainage times above 70° C. was believed to be the result of flashing of hot-water filtrate into the collector tank, with the consequent evolution of steam in excess of the capacity of the exhaust system. This reduced the vacuum in the collector tank to such an extent that an appreciable increase in drainage time resulted. With an extremely slow-draining pulp, however, the rate of hot-water removal was slow enough so that the flash steam did not exceed the capacity of the exhaust system. Hence, in this instance, the pulp drainage characteristics were more comparable to the variations in the specific viscosity of water. Furthermore, the order of magnitude of drainage time reduction by this means is clearly of secondary significance, as compared to the effect of relatively minor increases in pulp consistency.

The relation of mixed pulp composition to drainage time is given in Figure 6. These data are only approximate, but they indicate that similar pulps of not too widely differing drainage times will, when mixed, give a drainage time directly in proportion to the composition of the mixture.

Effect of Variations in Dewatering Pressures

A logarithmic relationship exists between the dewatering pressure and the solids content of the pressed mat (Figure 7). Probably of equal significance is the fact that, at a given pressure, similar pulps of varying degrees of refinement attain the same solids content. The rate at which pressure can be applied to different pulps, however, will vary, in general, in the same manner as their respective drainage times vary. Hence, although the equilibrium solids content is virtually independent of fiber refinement, the rate of reaching the equilibrium is closely related to the state of refinement.

Figure 8 shows the effect of dewatering pressure and pulp refinement upon specific gravity of oven-dried fiberboards. Here again the logarithmic relationship is marked, and it is also significant that an increasing degree of fiber subdivision results in an appreciable in-

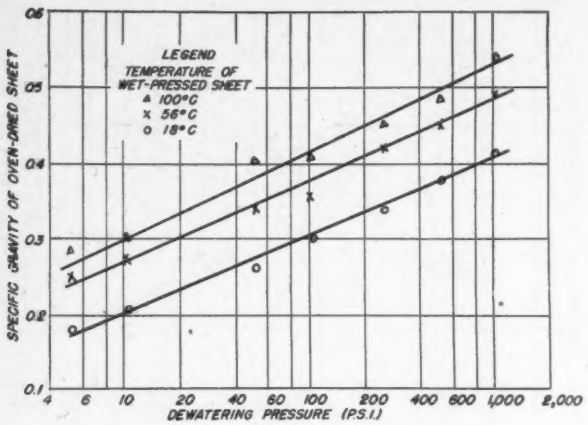


Figure 13.—Relation of dewatering pressures at several temperatures upon the specfic gravity of subsequently oven-dried fiberboards. All these specimens were prepared from 0.005-inch milled fiber.

crease in density for a given dewatering pressure. It may be observed that there is an apparent departure, in the extreme low-pressure range, of the observed points from the curves shown. The reason for this is that the total pressing force was so small at 5 to 10 psi. that it was difficult to measure and reproduce these low pressures with the same order of precision that can be readily attained in the higher pressure range. Hence, the values obtained at the higher pressures were relied upon for establishing the curve slope.

Factors Affecting Drying Time

The typical time-temperature charts of Figure 9 indicate a rather unexpected initial rise in temperature, which quickly drops to a lower and more stable temperature. This behavior was checked repeatedly on 10-inch square mats. It is believed to be caused by initial formation of steam, which is temporarily trapped in the interior of the mat, but in a short time exit passages develop that permit steam removal at a rapid rate.

The relation of drying temperature to drying time required to press fiberboards to a dry condition at several pressures is shown in Figure 10. The practical significance of this information is that elevated drying temperatures should result in an appreciable decrease in drying time. Since the total amount of heat required is virtually independent of temperature, this implies that greater production may be obtained in a given press time with negligible increase in steam consumption per unit of fiberboard produced.

The data for Figure 11, which shows the effect of sheet weight upon the required press drying time, were derived from other curves and are intended to show, in a general fashion, how the quantity of material per unit area affects the rate of drying under several pressures.

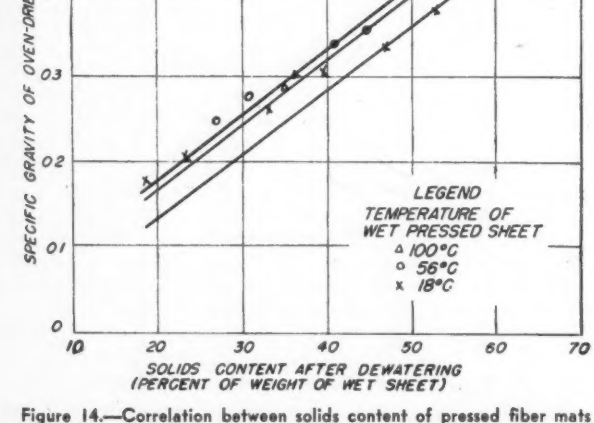


Figure 14.—Correlation between solids content of pressed fiber mats and specific gravity of oven-dried fiberboards. Mats were pressed at several temperatures and consisted of 0.005-inch milled fiber in all cases.

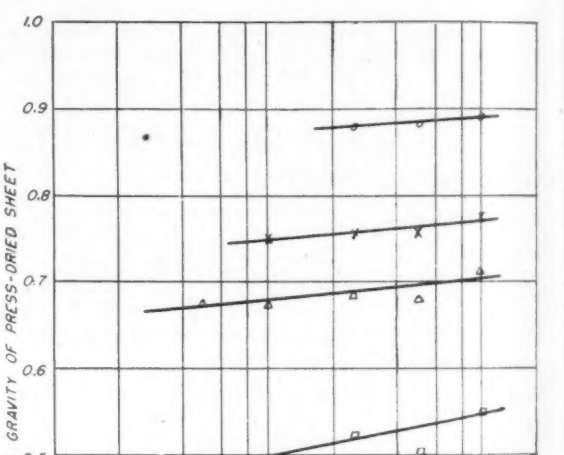


Figure 15.—Effect of dewatering pressure upon specific gravity of fiberboards subsequently press-dried under constant pressures. All specimens were prepared from 0.005-inch milled fiber.

Relations of Drying Pressure and Temperature on Gravity

The curves of Figure 12 illustrate the relation of drying pressure to specific gravity. With this type of pulp, which is comparatively resilient in character, extremely low pressures are necessary to give fiberboards of the desired insulating quality, and, conversely, specific gravities above 1.0 require very high pressures.

The effect of degree of fiber refinement is of considerably less importance in relation to final specific gravity obtained in press-dried than in oven-dried fiberboard.

Apparently temperature alone has a significant effect on final board density (Figure 13), but when considered in the light of the relationship shown in Figure 14, it is obvious that solids content prior to oven drying is the factor of prime importance. Thus, the means used to achieve a given solids content, whether by appropriate

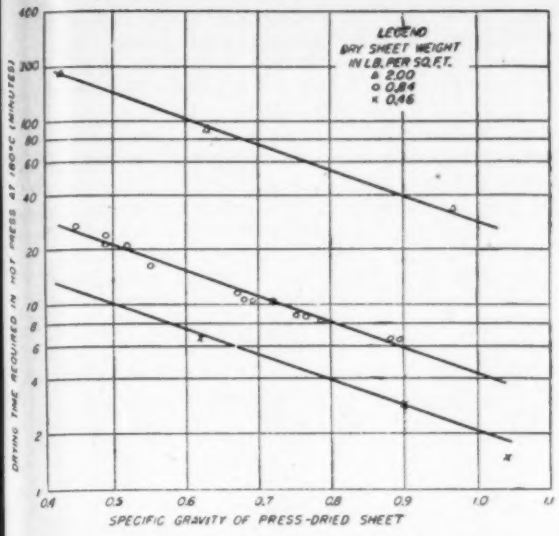


Figure 16.—Correlation of fiberboard specific gravity and press-drying time required for several sheet weights.

control of dewatering pressure or of temperature, is of secondary importance in the determination of the final specific gravity of the board.

From these data it is apparent that there is an overlapping range of fiberboard density that would permit either press-drying or kiln-drying technique to be used, but at the same time rather definite density limits are also indicated for these drying methods.

Effect of Dewatering Pressures on Specific Gravity

Effect of dewatering pressure upon the specific gravity of fiberboards that were subsequently press-dried under constant pressure is shown in Figure 15. These curves confirm the observations that drying pressure is the determining variable in controlling final board density, although dewatering pressure does have a small but significant effect, particularly on the boards dried at low pressure.

An additional fact of some practical interest was observed during this series of tests. When the wet mats were dewatered at pressures considerably above that used in drying, the water content was sufficiently reduced so that no free water flowed out during the initial hot-pressing cycle, with the result that no extractives or decomposition products were deposited on the caul plates. Polishing and cleaning of caul plates may be greatly reduced by following this practice.

The relative effect of specific gravity and sheet weight in controlling drying-time requirements is illustrated in Figure 16.

Strength Tests

The relation of specific gravity and modulus of rupture (Figure 17) presents a rather thorough array of data on these three closely related pulps, and several significant points of practical interests are as follows:

(a) A rather precise relation between density and strength in bending is apparent. For practical purposes the modulus of rupture may be assumed to be directly related to the square of the specific gravity. Thus, after relatively few tests, it is possible to determine the entire strength range potentially available with a particular pulp stock. This, of course, can only apply to fiberbard products prepared in a similar manner and would not neces-

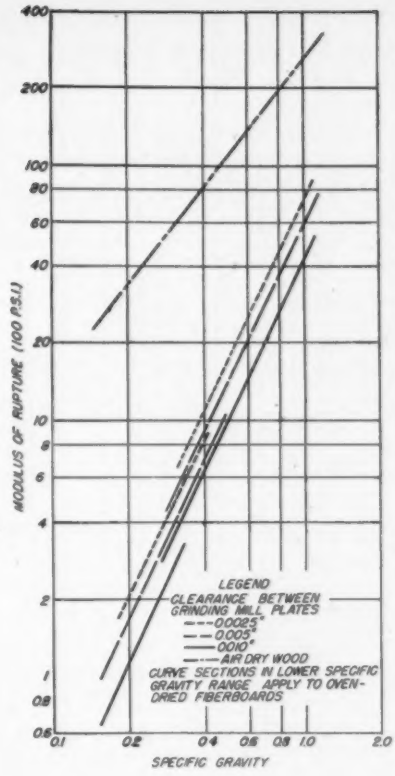


Figure 17.—Relation of specific gravity of oven-dried and press-dried fiberboards derived from similar pulps to modulus of rupture. The separated portions of each curve in the lower specific gravity range are based on the results obtained from oven-dried specimens. The curve for wood is included for reference purposes only.

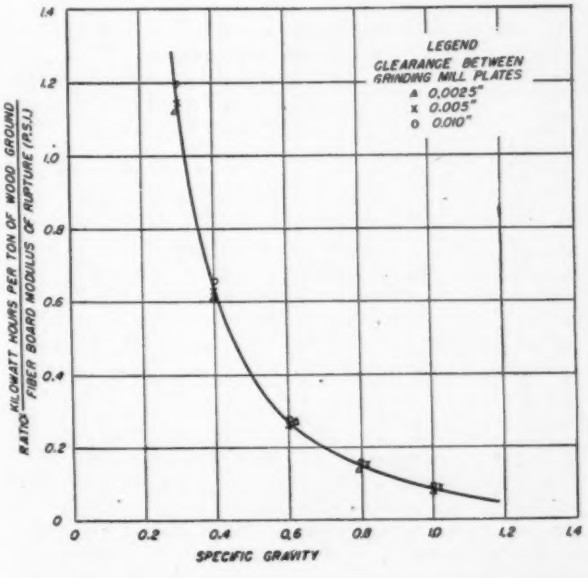


Figure 18.—Correlation of power consumed in the preparation of similar pulp stocks and the modulus of rupture of fiberboards derived from these pulps. Strength data at several specific gravities are based on curves obtained from a number of tests covering a wide range of density.

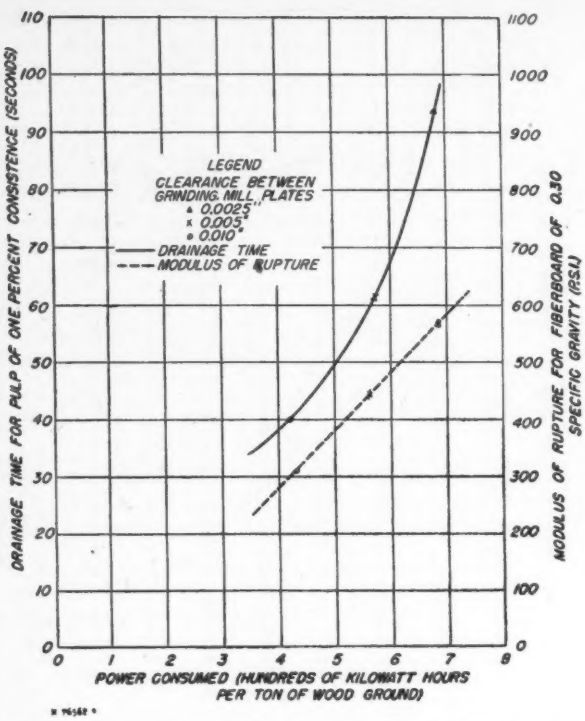

DRAINAGE TIME FOR PULP OF ONE PERCENT CONSISTENCE (SECONDS)
MODULUS OF RUPTURE FOR FIBERBOARD OF 0.30 SPECIFIC GRAVITY (PSI.)
LEGEND
CLEARANCE BETWEEN GRINDING MILL PLATES
▲ 0.0025"
× 0.005"
• 0.010"
DRAINAGE TIME
MODULUS OF RUPTURE
POWER CONSUMED (HUNDREDS OF KILOWATT HOURS PER TON OF WOOD GROUND)

Figure 19.—Comparison of drainage time and strength of pulp in relation to power consumed in grinding.

sarily apply to materials that are subsequently subjected to other treatments, such as oil, resin impregnation, or other chemical agents that may alter the nature of the fiber-bonding action to an indeterminate extent.

Since the strength-specific gravity slopes for all three materials are parallel, the general form of equation that may be used in the evaluation of similar fiberboard materials is:

where R_1 = modulus of rupture determined
G_1 = specific gravity at test
R_2 = computed modulus of rupture
G_2 = specific gravity at which it is desired to evaluate the material.

$$\frac{R_1}{R_2} = \frac{G_1^2}{G_2^2} \text{ or } \frac{R_1}{R_2} = \left(\frac{G_1}{G_2}\right)^2$$

In applying the equation, another factor must also be considered—that of moisture content at time of test. The exact magnitude of this factor has yet to be well established, but is is known to have a significant effect on the physical quality of these materials used and, hence, must be taken into account in the analysis of strength test data.

(b) There was a significant discrepancy between the strength of oven-dried and press-dried fiberboards of comparable specific gravity derived from identical pulp stock. At the present time, however, the experimental data are insufficient to permit a more critical evaluation of the two methods of drying fiberboards of intermediate density.

One approach to an explanation of this behavior might be presented as follows: Those fiberboards subjected to oven drying are exposed to an elevated temperature for a relatively long time and during an appreciable portion of the drying period a large amount of water is present in the fiber. This condition is conducive to a mild degree of hydrolysis, with a consequent reduction of fiber strength. It might be thought that the hydrolytic conditions are much more severe in press drying because of the higher temperatures used; but this also needs qualification, since it is apparent after an examination of the data presented in Figure 13 that the drying temperature of the wet portions of the mat is well below that of the press platens until drying is completed.

Perhaps another explanation of the strength variation between oven-dried and press-dried fiberboards is that in press-drying the surface fibers may be more positively oriented parallel to the plane of the sheet. Since the orientation of the outer fibers is of primary importance in the determinatinon of bending strength, the superior degree of surface fiber orientation in the press-dried sheet would account for a significant increase in strength.

The overlapping density range of fiberboards that could conceivably be produced by both of these drying methods is rather limited. Hence, precise comparison of the two methods is not of immediate technical importance.

Figure 18 presents the power consumption and strength relationship. These data are presented primarily to illustrate that these two factors are intimately related functions and that an adequate evaluation of a pulp stock should include a consideration of this relation. Perhaps the principal utility of this type of data lies in its value as background material with which to compare other procedures in the preparation of fiberboard pulps.

For pulps of the type and range of drainage rates investigated in this study, the power consumed in processing the fiber per unit flexural strength attained in the chine was four inches per minute in all cases. The spefiberboard product is virtually independent of the degree of fiber refinement.

The comparative relation of drainage times and the strength of fiberboard pulp stocks to power consumed in fiber processing is given in Figure 19. The essential fact here is that as higher strengths are developed, a disproportionate increase in drainage time results. This type of basic comparison is also of considerable worth in the precise evaluation of a pulp stock and as a relative measure of the effectiveness of stock preparation technique. These data are, of course, exceedingly limited and it was beyond the scope of this particular investigation to engage in a more thorough study of the many processing factors that are known to be of some influence on the quality of the final pulp stock.

The results of the tests to determine the magnitude of the segregation effect are presented in Table 1.

These data indicate that segregation does not have so significant an effect on coarse pulps as on the more finely refined pulps. The magnitude of the effect is not great in any event, however, as even under the extreme procedure used in forming these boards the difference in strength was in the range of five percent for the two coarser pulps and ten percent for the highly refined pulp.

TABLE I

Effect of Segregation of Fibers During Sheet Formation Upon Modulus of Rupture of Fiberboard

Position of filter screen surface in test	Clearance between grinding mill plates (inch) 0.010 Specific gravity	0.010 Modulus of rupture Psi.	0.005 Specific gravity	0.005 Modulus of rupture Psi.	0.0025 Specific gravity	0.0025 Modulus of rupture Psi.
Up	0.58	1,590	0.63	2,430	0.66	3,310
Down	.59	1,550	.63	2,350	.66	3,020

EQUIPMENT AND SUPPLIES

Copper to Copper Weld

Welding copper to copper is announced as a development to increase the strength and life of industrial truck motors. Displacing solder used to connect wire conductors in the armature, connections are made by

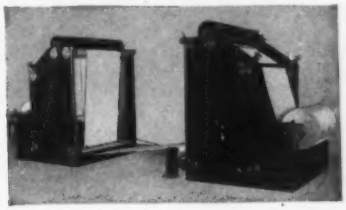
carbon-arc welding while a stream of water is played on the metal to keep down temperature. Melting point of copper is three to four times higher than that of the solder. used and higher than heat generated in an armature in severe service. All wires are insulated to the point where they are joined after being assembled in the armature. Insulations are protected from heat applied to melt the copper by means of water jet led in rubber tube to parts near the electrode. Excess heat is localized and dispersed in form of steam. Armature is mounted vertically on shaft on workbench and rotated during welding. In a 3- to 5-h.p. motor, 65 separate welds are made. Fiberglass and asbestos in threads and tape used for insulations are indicated as contributing to the success of the process and the life of the motors. For details and prices write to Elwell-Parker Electric Co., 4223 St. Clair avenue, Cleveland, Ohio.

Foil Mounting Adhesive

Foil Mounting Adhesive No. 884 is currently in use for mounting foil to sulphite stock, tissue, and plain and coated-one-side glassine. It is described as producing a bond with an extreme degree of water resistance, in addition to its foil mounting and converting qualities. Of value on parchment where resistance to boiling is a requisite. Report of manufacturer's tests on foil laminations boiled in water for eight hours shows no evidence of delamination after removal from water. Because of its medium heavy syrup consistency, adhesive takes dilution of 10 to 25 percent and can be applied in a minimum film. For details and prices write to F. G. Findley Co., 3033 West Pemberton avenue, Milwaukee 10, Wis.

Web Tension Control

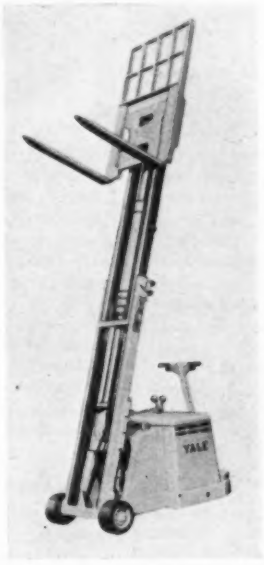
The Web Tension Control Unit has been developed to provide constant tension and constant velocity on a web of paper during printing. Similar machines using the same control principle are available for the paper indus-



try as winding units, unwinding units or both, as required by the process. Designed to maintain constant tension in range from a few ounces to hundreds of pounds regardless of speed or stops required in operation. Announced operating speed, 60 to 3,200 feet per minute. For details and prices write to Black Industries, 1400 East 222nd street, Cleveland, Ohio.

Telescopic Worksaver

The 120-inch Telescopic Worksaver, tilting fork model, was designed to make maximum use of available headroom in highstacking operations. High reach of 120 inches combined with lowered clearance of 83 inches is de-



scribed as a ram-within-a-ram arrangement. When outer hydraulic piston has fully extended upward, an inner one begins to extend downward, doubling the lift available. Specifications legend: capacity, 3,000 lbs.; travel speed under full load, 2 miles per hour; lift with 2,500 lb. load, 8 feet per minute; tilt, 18 degrees in 10 seconds; total weight of truck including 19-plate battery, 3640 lbs. Dimensions, 33 inches wide by 64 inches long. Though battery powered, truck is guided by a walking operator. For details and prices write to Yale & Towne Mfg. Co., Materials Handling Div., 4530 Tacony avenue, Philadelphia 24, Pa.

Triad Log Loader

The Triad Log Loader is a self-powered hydraulic hoist mounted on a conveyor elevator. Handles eight-foot pulp logs for loading and cold-decking. Original model was developed for pulp logging operations of a large pulp mill

operator where former loading is said to be cut to a fraction and with a manpower saving. Steel construction, center-balanced on steel axle with standard heavy-duty wheels, pneumatic-tired for mobile operation. Elevator section operated by pneumatic hoist attains maximum height of approximately 12 feet for stacking or loading; powered by its own 6 to 9 h.p. gas engine with chain drive, includes built-in clutch and gear reduction; conveyor is No. 78 malleable conveyor chain spaced with 6-inch growsers. Over-all length 17½ feet, width 5½ feet, approximate weight 3,500 lbs. For details and prices write to Northwest Machine Works, Loader Division, 1727 South East 11th avenue, Portland 14, Oreg.

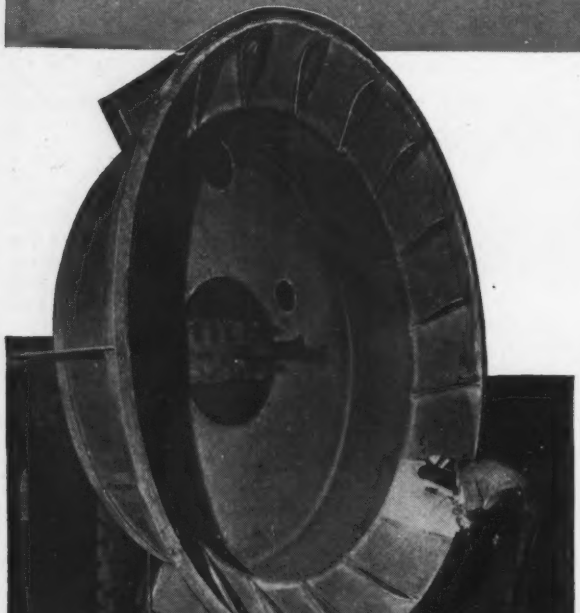
Sludge Acid Recovery

A flexible, low-temperature process for sludge acid recovery is announced as the Monsanto-Ross-Wilde process designed to solve the problem of sludge acid disposal. Said to be flexible enough to operate efficiently on any strength acid waste sufficiently fluid to be pumped, and to produce a gas higher in SO_3 content than that of burning pure sulfur.

Process is said to accommodate any type of sulfuric acid-hydrocarbon sludge, the only requisites being that final feed sludge be pumpable liquid and that chemically it contain a minimum of .08 pounds titratable H_2SO_4.

Designed as a "package" decomposer unit, multiples to be installed to meet varying requirements. For details and prices write to Monsanto Chemical Co., St. Louis 4, Mo.

20% INCREASE IN PRODUCTION! NO MAINTENANCE SHUTDOWNS!



It's made of Nickel-Clad Steel

(*Left*) Fabricating a hydrapulper for Dilts Machine Works, Fulton, N. Y., Div. of Black-Clawson, Inc., Hamilton, Ohio, in the plant of Smith & Caffrey Co., Syracuse, N. Y. (*Right*) Installed hydrapulper, showing Lukens Nickel-Clad Steel on tub sides and bottom plates surrounding the rotor; in use at National Paper Corporation, Ransom, Pa.

Self-cleaning and corrosion-resistant properties of Lukens Nickel-Clad Steel for hydrapulpers make an important contribution to their excellent service records. The above hydrapulper has been in service at the National Paper Corporation, Ransom, Pennsylvania, for more than 16 months without a shutdown for maintenance.

In operation, the work-polished walls of Lukens Nickel-Clad Steel, with the cladding on the inside, require no sluicing down, in contrast to the former type tubs which required at least one sluicing per four fills. This factor was the major contribution in increasing the machine's output approximately 20 per cent. In addition, there is no metallic pick-up to impair the quality of tissue made from furnish produced here.

Lukens Clad Steels—Nickel-Clad, Stainless-Clad, Inconel-Clad and Monel-Clad—provide *solid* corrosion-resistant metal protection at the lower cost of *clad* steels. 10% or 20% of total plate thickness suits most applications. Lukens offers the most complete range of clad steels available from any source; $\frac{3}{16}$" to over 3" thick, or as wide as 178".

Bulletins 255 and 338 give information which will help you adapt Lukens Clad Steels to your equipment. For copies, write Lukens Steel Company, 403 Lukens Bldg., Coatesville, Pennsylvania.

CLAD METAL STEEL

LUKENS
Nickel-Clad Stainless-Clad
Inconel-Clad Monel-Clad
STEELS

Visit us at the Shows!

Booths 9 and 10
The National Chemical Exposition
Chicago Coliseum
October 12 thru 16

☆

Booth 320
National Metal Exposition
Convention Hall, Philadelphia
October 25 thru 29

SOLID METAL ADVANTAGES WITH CLAD STEEL ECONOMY

SECTION OF THE

TECHNICAL ASSOCIATION
OF THE PULP AND PAPER INDUSTRY

122 E. 42nd ST., NEW YORK 17, N. Y. Edited By R. G. MACDONALD, Secretary

Testing Printability of Paper With Ink–II*

By Otto P. Berberich[1], Louis F. Engelhart[1], and Milton Zucker[1]

(Continued from August 12, 1948 Issue)

Recommended Procedure for Determining Picking

The procedure used and recommended by the Chicago factory and laboratory is as follows:

1. Use a solid printing plate 1½ × 12 inches and the solid vibrator. Mount the plate crosswise in the press, close to the head, so that the paper will be printed close to but a reasonable distance from the grippers.

2. Apply ten volumeter notches (2½ cc.) of the soft yellow evenly across the vibrator and allow to distribute.

3. Ink the plate completely by rolling across at least four passes back and forth.

4. Trip the inking rollers. This is to decrease resistance so that a higher printing speed is permissible by manual operation.

Print the paper samples (previously prepared) with the maximum speed possible. The cylinder can literally be "snapped" around.

5. If the paper shows the proper indications of comparative picking, make these notations.

If the paper does not show picking on any of the samples, comparative strength can obviously not be made and the next heavier inks must be considered.

When the next inks are printed on the same sample makeup, it will be necessary to move the printing plate in the press bed so that a new position is obtained on the sheet.

If picking is evidenced, and tests are desired with the same ink on other samples, wash the plate clean and dry and proceed as per (3) etc.

No more than six prints should be made from each operation without washing the press completely and starting over from (2) etc. It has been found that the volume of ink carried is an important influence on the results and therefore should be kept as constant as possible; printing decreases the amount of ink on the form.

The test is complete when significant differences are apparent.

6. It is recommended that all tests be run at the same temperature since inks decrease or increase in body or tackiness when used at different temperatures.

7. It is suggested that any single printing operation not be carried over more than 30 minutes in order to eliminate the possibility of increase of tackiness on the press over long periods of time.

In the authors' laboratory still a third test is used, for papers which are to be used in high speed web printing with heat-drying inks. A standard heat-setting black ink of 40 poise viscosity is used and allowed to remain on the rollers and pick up tack by evaporation of solvent. With the standard ink, a viscosity of 100 to 150 poises is attained in 15 minutes depending on temperature. The ink bodies continuously until it is too dry to transfer; this point is ordinarily reached in 70 to 90 minutes. In carrying out the method, the ink is allowed to distribute for 4 minutes using the quantity of ink necessary to give good printing; the first proof is then pulled. Proofs are then pulled at 15 minute intervals until picking occurs, or the ink is too dry to transfer.

Where the papers to be compared vary in ink receptivity, it is necessary to wash up the press after each print since the papers leave different film thicknesses of ink on the press. This increases the time involved since it is necessary to wait 4 minutes, 15 minutes, 30 minutes, etc. each time a print is made.

The method is slower than the other methods and is therefore not recommendable for routine testing; but it has the advantage that the ink attains higher tack than it is possible to obtain with the graded series. Furthermore, this method will identify those papers which are sufficiently strong never to pick with heat-drying inks under those test conditions—such papers have been found in tests.

Comments

Nothing needs to be added to the comments in Weymouth's paper on the cost and desirability of the method, but the authors have had one experience recently which points a moral to both printing paper and printing ink manufacturers.

Recently, one customer decided to print one of his jobs on high speed web fed rotary presses supplanting its sheet-fed presses. We were called in to furnish the ink, and the paper supplier to furnish paper. Instead of going separate ways, the inks (chosen on the basis of experience with other accounts) were pretested with a number of different coated papers (chosen on the basis of similar experience), observing printability, speed of

*Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Hotel Commodore, New York, N. Y. Feb. 23-26, 1948.

[1]Research Laboratories, International Printing Ink Div., Interchemical Corp., New York, N. Y.

absorption and drying, ink receptivity, and pick point.

Two interesting observations were made in this test. First, the physical test data on the papers were not always confirmed by the proof press tests; in many cases, papers reversed in properties under actual test. Secondly, the paper finally selected for the first commercial trials was not the paper which would have been selected on the basis of the ordinary paper mill tests.

Of course, this case would not have been mentioned if the proving had not provided a paper-ink combination which clicked immediately. But this is not the only instance in which such joint endeavors have proved profitable to the ink maker, the papermaker and their mutual customers.

Acknowledgments

The authors wish to express their appreciation to F. A. Weymouth and Erick Walline, of our Chicago factory and laboratory, for their help in the work; and they wish to thank H. N. Case, now retired, G. K. Dickerman of Consolidated Water Power and Paper Co., and H. M. Annis and A. E. Jones of Oxford Paper Company, for their help in reading and criticizing the manuscript.

Literature Cited

1. Weymouth, F. A., Testing Printability of Paper with Ink. *Paper Trade J.*, April 9, 1942.
2. Green, Henry, *Ind. Eng. Chem., Anal. Ed.* 14, 576 (1942).
3. Reed, R. F., The Inkometer—Technical Bulletin No. 2—Research Series No. 4—Lithographic Technical Foundation.
4. Green, Henry, *Ind. Eng. Chem., Anal. Ed.* 13, 632 (1941).

It is suggested that any correspondence about this paper be addressed to Milton Zucker, International Printing Ink Div. of Interchemical Corporation, 432 West 45th Street, New York 19, New York.

Some Basic Concepts of Statistics and Their Application to Simple Industrial Experimentation*

By Maynard S. Renner[1]

Abstract

Certain of the basic concepts of statistical methods are discussed in terms of a simple experimental problem particularly with the experimentalist who is not a trained statistician in mind.

Although the discussion is largely in quantitative terms, emphasis is laid upon the fact that the value of the science of statistics is that it affords a more quantitative method of treatment of the problem of handling data.

Ever since they began to experiment, experimenters have been concerned with the problm of handling data. Over the years a body of knowledge as to how data should be handled has been developing. Many men from many fields—mathematics, biology, chemistry, physics, economics, have contributed until today a great deal is understood about the basic nature of the subject. Arriving at this degree of understanding has required the development of a brand new science, the science of statistics.

Statistics as such is in large part concerned with the detail of the problem yet there are certain basic concepts in this field which can be generaized and which it is believed should prove helpful to those who, although not trained statisticians, are vitally concerned with the problem of handling experimental data. It is the purpose of this paper to discuss some of these basic concepts in terms of one of the simplest known problem from the point of view of tatistical analysis.

This problem, occurring not infrequently in the laboratory, is to compare two different treatments when there is no quantitative way to measure data, a "go" or "no go", success or failure type of judgement must be used. For example, it might be wanted to know the comparative value of wrap against no-wrap in protecting a product from a certain type of deterioration during storage, but with no quantitative method available for measuring this type of deterioration. Or R. A. Fisher describes the problem of testing a lady's claim that she could distinguish cups of tea made by pouring tea into milk from cups made by pouring milk into tea. Fisher designed a more sophisticated experiment, but this claim could have been tested by preparing pairs of cups of tea, one of each pair made in each of the two ways and seeing if the lady could have made the correct choice in enough pairs to have significance. Comparisons may be between two different treatments as in the case of the cups of tea, two different materials, two different mixing schedules, or cooks or any other two variations.

Of course, where there is no apparent variability present, as for example when one treatment gives all successes and the other treatment gives all failures, there is no problem in making a decision between the two. This problem gives trouble only when there is variability present. For example, two plasicizers may be evaluated comparatively, for some quality such as their ability to give a film adhesion to paper. In some pairs one gives better results, in other pairs the other gives better results; the problem is to decide from somewhat conflicting, not very clear-cut data whether or not, for practical purposes, there is any difference between the two.

* Presented at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 23-26, 1948.

[1] Dewey and Almy Chemical Co., Cambridge 40, Mass.

Possible Results to be Expected

In considering this problem, it would be valuable to know what type of results could be expected if there were no difference between the two. This information can be obtained. It is given by expansion of the binomial $(p+q)^n$ where p is the probability of success for one of the two treatments, (plasticizer, wrap, etc.) q the probability for failure ($p + q = 1$) and n is the number of pairs to be included in the test.

Probability is measured here on the scale of 0 to 1, 1 indicating certainty that an event will occur, and 0 certainty that it will not occur. For example, if a coin is tossed in the air the probability is 1 that it will come down again, 0 that it will not come down again (or stand on its edge when it does come down) and, if the coin is evenly balanced, ½ that it will come heads and ½ that it will come tails. Probability in this sense is the ratio of successes to total number of trials as the total number of trials is taken indefinitely large.

If there is no difference between the two, $p = q = ½$. Then the relative probabilities for 0, 1, 2, etc. up to n successes (i.e. one treatment or one member of the pair coming out better than the other) for different values of n can be calculated simply by expansion of the binomial $(½ + ½)^n$ or more simply by substitution in the

$$p^n{}_r = \frac{n!}{r!\ (n-r)!}\ p^r q^{n-r}$$

formula where r is the number of successes. These probabilities for values of n up to 6 are given in Table I.

These are the probabilities or better, the relative frequencies, of the different number of succsses to be expected over a long run of trials. Such a long run of trials composes a population. For the purposes of statistical analysis it is convenient to imagine this population as being composed of an infinite number of trials and hence being an infinite population or universe. In this sense such populations are hypothetical rather than actual. Yet they are important because they tell the whole story regarding the distribution of frequencies that might be expected from an infinite number of trials for any given values of p, q, and n.

If p and n are known or can be assumed, the relative frequencies can be calculated simply by substitution in an algebraic expression and arithmetic evaluation. The mean (or average number of successes) is always np and the standard deviation (a measure of the spread) is $\sqrt{npq}$. If mean and standard deviation are known the entire distribution is known, since $q = 1 - p$, and simple substitution in the two simultaneous equations in two variables will yield both n and p, thus these two numbers are adequate to describe an entire binomial distribution.

In this way a large mass of numbers can be described in terms of a few simple numbers. Normal distributions, and some other distributions used in statistical analysis can also be described by a few numbers just as the binomial distribution can be.

Laboratory Data as a Sample

But to speak of infinite populations implies an infinite number of tests, what of laboratory data which may be the result of one single test? Laboratory data should be random samples from infinite populations in which each individual has an equal and independent likelihood of being chosen. If the experimental work has been properly done, these samples differ from some infinite population not because of experimental errors, but solely because of the workings of the laws of probability.

The sample of laboratory data and the infinite population are looked upon as two entirely different things. The sample, it is true, is tangible, concrete, a piece of laboratory data, a group of numbers. The population is an abstraction, and intangible thing, a thing which cannot be described until certain basic assumptions concerning it have been made. Yet when these basic assumptions have been made, all of the other characteristics of the population can be calculated, so that the behavior of samples that might be drawn from it can be specified with beautiful precision. The sample, in spite of its concreteness and tangibility, might have come from many populations, some of them at the extreme limits of probability, populations with widely different characteristics.

The random samples of laboratory data can be described by a few simple numbers, just as can populations; but only approximately. There never can be complete certainty as to what population a sample lot of data might have been drawn from. Consequently the numbers used to describe data are called estimates or statistics, while the numbers used to describe populations are called parameters. Statistics alway have ditributions, parameters have none. Thus statistics is the science of the variability of parameter estimates.

The problem is to relate the sample to a population. This can be done by the use of statistical techniques to describe the behavior of samples drawn from a hypothetical population and to estimate the probability that a particular sample could have been drawn from that population.

The Null Hypothesis

This process of estimating as used in statistical procedures requires the stating of a hypothesis. There is always some kind of a hypothesis, no matter how vaguely stated, in back of every experiment. But there are very definite specifications about form and treatment of the hypothesis used in statistical analysis. A hypothetical infinite population assumed and its behavior calculated on the basis of its hypothetical characteristics. The hypothesis states that the sample could have been drawn from a hypothetical population by pure chance. If there is a probability that the sample could have been so drawn, the hypothesis is accepted and the differences between the sample and the infinite population are assumed to be due to chance. If there is a low probability (called level of significance) that the sample could have been drawn from that infinite population by chance, then the hypothesis is rejected. This hypothesis is called the null hypothesis.

But the usual null hypothesis is the reverse of the normal experimental hypothesis. It states that the effect being tested for does not exist, in the problem being discussed here, that there is no difference between the two treatments. In this sense it is similar to the dictum of the law that a man is innocent until proven guilty. It must be disproved before the effect being tested for can be believed to exist. If the null hypothesis is disproved the effect is assumed to exist. The null hypothesis can never be proved, it can only be disproved.

This point is brought out clearly in R. A. Fisher's discussion of the lady and the cups of tea. She claims that she can tell by taste whether the tea was added to

TABLE I.—RELATIVE PERCENTAGE FREQUENCIES OF 0, 1, 2, ETC., UP TO n SUCCESSES IN n PAIRS, $p = q = ½$, OVER A LONG RUN OF TRIALS (FROM EXPANSION OF THE BINOMINAL $(½ + ½)^n$)

Number of Successes / Number of pairs (n)	0	1	2	3	4	5	6
2	25	50	25				
3	12.5	37.5	37.5	12.5			
4	6.25	25	37.5	25	6.25		
5	3.125	15.625	31.25	31.25	15.625	3.125	
6	1.5625	9.3750	23.4375	31.2500	23.4375	9.3750	1.5625

the milk or the milk to the tea. An experiment is outlined in which she is to be given eight cups of tea to sort out, four of each kind. But the null hypothesis set up is that the lady has no means of distinguishing between the two kinds. It is to be conducted in such a way that if she has no way of telling by taste there is very little chance for her to sort them out properly. If she does sort them out properly, then it would be considered that the null hypothesis had been disproved. But it would not prove the opposite— that she has some means of distinguishing. This hypothesis, however true it may be, is so inexact that it cannot be proved. It could be made exact by restatement as the hypothesis that she could never be wrong. But the trouble with this hypothesis as a working basis is that a single failure would disprove it and an infinite amount of experimentation would be needed to prove it.

To return to the problem of comparing two treatments, the null hypothesis would be that there is no difference between the two treatments. On this basis the number of successes with either treatment would be the number expected with high probability from expansion of the binomial $(\frac{1}{2}+\frac{1}{2})^n$. Or the same as the number of heads that could be expected from tossing a coin the same number of times as there were pairs in the experiment. These probabilities have already been given.

Inadequacy of Some Experiments

Study of these values shows immediately that some numbers of pairs are going to be inadequate to disprove the hypothesis no matter how false. For example, in a trial of two pairs, two successes or two failures occur 50% of the time, so two successs or two failures can never disprove the null hypothesis. Similarly, for three successes in three pairs. There is a 25% probability that either one treatment or the other will give three successes in three trials. Anyone who has ever watched three persons match coins and seen the occasional difficulty experienced in getting away from the combination of three heads or three tails will not doubt this point.

Determination of Degree of Risk

Of course one could make a decision with any degree of risk he desires of being wrong, but how much risk should be taken? This question is to some extent subjective and depends upon the experimenter's knowledge of his field. Decisions in agreement with past experience and beliefs will be made with a greater risk of being incorrect, than decisions which are contrary to past experience. The importance of the decision being made counts greatly. A fairly high probability of an incorrect decision might be acceptable in a simple comparison of two plasticizers, for example, where no great harm would be done if it were wrongly decided that one was better than the other. Before making an important decision requiring the expenditure of a large sum of money, one would want to be very sure of being right and hence would require a very low probability of error.

There are also two types of errors which can be made in accepting or rejecting a null hypothesis. The hypothesis may be rejected when it is true, (error of the first kind) or accepted when it is false (error of the second kind).

The probability of rejecting the hypothesis when it is true may be made as small as desired by reducing the probability required for rejection to as low a value as desired. But in requiring a low probability before rejection of the hypothesis one runs the danger of missing a real difference between the two treatments or, in other words, of making an error of the second kind.

Confidence Limits

The problem then, from a statistical point of view, is to set the value for the risk of making a wrong decision where the probability for making the two types of errors are balanced out or minimized. It has been concluded that the best results in experimentation are usually obtained if the hypothesis is rejected when the data show that there is a 5% or less probability of its being true and accepted when the probability is greater than 5%. This 5% probability level is usually called the 95% level of significance. In some cases the level of significance may be higher. Much quality control work is done on the basis of a 99% level of significance. During the war, when faulty equipment might have meant the loss of human lives, a battle, or even a campaign, much higher levels of significance were required before accepting lots of military equipment.

Note that one never knows what proportion of errors of the second kind are being made. The samples that these errors are made about cannot be distinguished from samples that might be really out of the hypothesized population. Their proportion will depend upon how close the truth is to the hypothesis.

Possibilities for Accuracy by Better Design

Apparently a large number of pairs would be required to demonstrate a real difference between two treatments with a probability of 5%. But there are ways to modify the experiment to give increased sensitivity. Fisher, for example, in his experiment with cups of tea begins, not with paired cups but with four cups of each kind prepared and presented for testing in random order. Then the probability for choosing four cups correctly by chance alone becomes 1 in 70 which is below the 5% level. This experiment has significance when all four cups are chosen correctly, but no significance when only three are right and one wrong. He goes on to discuss other modifications which give still greater sensitivity

Testing the Hypothesis

The actual process of testing the hypothesis is simple if the hypothesis is properly stated and the experiment properly designed and conducted. In the case of the problem considered here, it consists only of a simple examination of the data to see if it could have come from the population specified by the null hypothesis with the desired degree of probability or level of significance. It should be remembered, however, that if the hypothesis has not been well stated or if the experiment has not been properly designed or conducted, then it may be impossible to apply statistical techniques.

Superiority of Measurement Data

Another way to get more sensitivity is to base evaluation upon a measurable quality rather than upon "go" or "no go," success or failure. Long study may be needed to find such a quality. But when the situation justifies, remarkable savings may be made since measurement data can be handled by means of the normal distribution where success or failure data fall into the binomial distribution.

The binomial distribution takes no account of the nature of the data other than the values p and n. Measurement data that are closely bunched together will have more significance than measurement data that are widely spread. The normal distribution can take this into consideration in showing up differences between data.

This point indicates the fallacy of a procedure sometimes used in examining measurement data which is rather widely spread and hence apparently lacking in significance. If the measurements do seem not good enough to permit of making a decision, the successes and failures, or the number of times one treatment gave more satisfactory numerical values than the other treatment, are examined. This procedure has little or no value since the binomial distribution is inherently less effective for comparisons than the normal and any attempt at examination of measurement data by means of the binomial represents a definite loss in efficiency.

Many of the difficulties frequently encountered in examining data of this sort could be avoided by keeping the concept of the null hypothesis in mind. Many experiments yield data incapable of disproving the null hypothesis. Sometimes increasing the size of the experiment or making other improvements in its design, or refinements in experimental techniques, may give a result which justifies rejection of the null hypothesis. But often also the null hypothesis cannot be disproved either because it is true or because it is so close to the truth as to require an excessive amount of testing to disprove it.

Drawing Inferences About Populations from the Samples

Sometimes it is impossible to develop a satisfactory description of an infinite population to compare the sample with. Then one would like to be able to draw inferences about the population from which the sample was drawn. This operation involves inductive rather than deductive reasoning since it is reasoning from the particular back to the general. For many years it was the subject of much discussion and study among students of probability.

Two very simple problems which illustrate the type of reasoning involved here, are given in Kenney. One problem can be solved, the other cannot. The problem which cannot be solved concerns an urn containing five balls, black, white, or both kinds. Three balls are drawn out together; two are black and one white. What is the possibility that the urn contains three black and two white balls? This problem cannot be solved because not enough is known about the distribution of the balls in the urn to begin with.

A problem which can be solved concerns the sophomore student who playing both football and baseball, broke his leg in one of the two games. What are the probabilities in favor of football and baseball respectively as the cause of the accident? The total number of games of each kind the student had played is known. The national proportion of broken legs in football and baseball games is also known. Therefore, this probability can be calculated. Since an equal number of games of football and baseball were played at his college, and since the probability of a broken leg in baseball from the records is 2 in 100, and in football 7 in 100, then there is a 7/9 aposteriori probability in favor of football as the cause of the broken leg.

With respect to laboratory data, the modern treatment of the problem in barest detail is as follows. A statistic whose distribution function is known or can be postulated can usually be computed from a sample. Then from this statistic it is possible to make an estimate of the range within which the population value lies. This estimate can be made with the desired degree of confidence or risk. The risk taken, however, is a long run risk and applies to all sample values and all populations in all of the experimenter's experience. Thus in the long run of experience in estimating population values from sample values, the risk taken may be held within any desired limits.

At first sight it would appear permissible instead to say that given a certain sample value for a statistic, the probability of the population value lying within given limits can be calculated. This statement sounds almost the same as the first and accurate statement. But it is inaccurate because it involves certain assumptions, which cannot safely be made.

It assumes a distribution of population values. But when working with a single sample or with samples taken from tests run under controlled conditions, then the samples must be looked upon as coming from one single population. Then they can be related only to that single population and not to any distribution of populations.

Even more important is the fact that such a statement assumes knowledge of the distribution of such assumed population values. But there is no way of knowing how these values might be distributed if they existed.

It is rarely in cases of this kind that all of the probabilities are known. And attempts to reason backward from the event to the probability require either knowing all of the probabilities or assuming knowledge of the distribution of the probabilities. An example of a misapplication of this type of reasoning is Laplace's statement that since the sun has risen 1,826,213 times in the 5,000 years until the day he was speaking of, then the probability was 1,826,214 to 1 that it would rise the next day. There is something inherently attractive about such a statement but one does not know all the probabilities involved. How wrong it may be can be seen by contrasting the statement that since the same postman has appeared with the mail every past week day morning for 40 years there are $40 \times 52 \times 6$ plus 1 or 1249 chances to 1 that he will appear the next week day morning, Here it is plain to see that increasing the number of occurrences is reducing instead of increasing the probability of further occurrences.

This wrong use of what is known as inverse probability sponsored by Laplace and other thinkers of his time has undoubtedly colored much of our less formal, unconscious thinking about the nature of experimental data. Yet modern thinking in the field of statistical techniques concerned with the application of scientific method to handling data, rejects this type of reasoning.

It is rejected because it is not quantitative. And the science of statistics is quantitative. In fact, the basic concepts of the science which have been discussed here, although discussed descriptively, have all been about ways and means of viewing laboratory data so as to permit of a quantitative estimation of the uncertainties involved in the data. It seems true that there will always be uncertainties about experimental data. Yet the science of statistics offers as much of an improvement in obtaining quantitative estimates of these uncertainties as modern refinements in experimental techniques offer improvements in the degree of quantitativeness of the experiments themselves.

References

1. Fisher, R. A., "Statistical Methods for Research Workers." 8th Edition, G. E. Stechert & Co., New York, 1941.
2. Fisher, R. A., "The Design of Experiments." 3rd Edition, Oliver & Boyd, Ltd., Edinburgh, 1942.
3. Freeman, H. A., "Industrial Statistics." John Wiley & Sons, New York, 1942.
4. Kenney, John F., "Mathematics of Statistics." Part Two, D. Van Nostrand, Inc., New York, 1939.
5. Ryder, Paul P., "An Introduction to Modern Statistical Methods." John Wiley & Sons, Inc., New York, 1939.
6. Tippett, L. H. C., "The Methods of Statistics." Williams & Norgate, Ltd., London, 1937.
7. Uspensky, James Victor, "Introduction to Mathematical Probability." 1st Edition, McGraw-Hill Book Co., New York, 1937.

TAPPI Plastics Conference

Institute of Paper Chemistry, Appleton, Wis.

August 16-17, 1948

The first fall meeting of the 1948 series of the Technical Association of the Pulp and Paper Industry was held at the Institute of Paper Chemistry at Appleton, Wis., and was sponsored by the TAPPI Plastic Committee. E. C. Jahn of the New York State College of Forestry, Syracuse, N. Y., was general chairman. T. A. Howells of the Institute of Paper Chemistry was chairman of the Local Arrangements Committee.

The meeting was opened by Dr. Jahn who called upon the Association Secretary, R. G. Macdonald, to make the opening remarks. Mr. Macdonald discussed the new practice of the Association of holding several national fall meetings as held prior to the war.

The attendance of about 250 was twice as large as the Plastics Conference of 1947 held at Syracuse and was typical of the attendance trend of the new functional meetings, some of which are larger than the general fall meetings formerly held.

The program of Monday, August 16 was extremely interesting as coordinated by Herman Mark of the Polytechnic Institute of Brooklyn. Dr. Mark led a symposium on the Adhesion of Resins to Cellulose Fibers.

Four presentations featured this symposium.

R. C. Hasselbart of the Plaskon Division of Libby-Owens-Ford Company, Toledo, Ohio, discussed "Aminoplasts." R. L. Steller of B. F. Goodrich Company, Akron, Ohio, talked on "The Adhesion of Vinyl Polymers and Acrylonitrile-Butadiene Copolymers to Cellulose," and C. J. Straka of the Westinghouse Electric Corporation, Micarta Division, E. Pittsburgh, Pa., discussed "The Technical Aspects of the Adhesion of Phenolic Resin to Cellulose." Dr. Mark then brought these subjects together in a consideration of "The Fundamental Aspects of Plastics to Fiber Adhesion."

These papers will be published, as presented, at a later date. Much data of value was presented on such plastic materials as the ureas, phenols, melamines, vinyls, rubbers. It was evident from the talks given that the subject of synthetic resins is beginning to resolve itself into a few important classifications in so far as paper and pulp are concerned and a number of fundamental concepts are beginning to evolve from a very complex and confusing subject.

In his fine summation Dr. Mark indicated the ways in which a resin adheres to cellulose. These may be classified as (1) Mechanical bonding; (2) Polar bonding (in which the molecules must have a proximity of from 4-5 Anstrom units and require from 2000 to 4000 calories per mol to be forced apart); (3) Hydrogen bonding (requiring a proximity of 2.5 to 3 Angstrom units and an energy of 5000-8000 calories per mol); and (4) Covalent bonding (requiring 1.5 to 2 Angstrom units and 50000 calories per mol). The latter produces the strongest bond but is difficult to attain.

On Monday evening the TAPPI Lake States Section sponsored a buffet supper at the Butte des Morts Country Club.

The program of Tuesday, August 17th was devoted to a panel discussion of Plastics in Paper Converting. J. C. Pullman, American Cyanamid Company and R. A. Barkhuff, Jr., Monsanto Chemical Company, presided in place of R. H. Mosher who was unable to be present.

In this program the following six papers were presented:

1. "Machinery for the Application of Plastic Coatings," by Arthur Gaio, John Waldron Corporation, New Brunswick, N. J.
2. "Solvent Coatings," by Creed Grumbles, Shellmar Products Company, Mt. Vernon, Ohio.
3. "Hot Melt Coatings" by Paul Yoder, Pyroxylin Products Company, Chicago, Ill.
4. "Water Dispersed Coatings," by E. B. Osborne, B. F. Goodrich Company, Akron, Ohio.
5. "Organosol and Plastisol Coatings," by John Rich, Plastic Film Corporation, Plainfield, Conn.
6. "New Developments in Coating Resins," by J. C. Pullman, American Cyanamid Company, Stamford, Conn.

Those present included:

A

Alton Box Board Company, Alton, Illinois, Wilson, Norval F.; American Box Board Co., Grand Rapids, Mich., Ritzema, G. P., Tobin, W. R.; American Can Co., Maywood, Illinois, Jensen, Stephen F.; Appleton Coated Paper Co., Appleton, Wis., Lewenstein, A. Pape, William H.; American Coating Mills, Elkhart, Ind., Rice, Richard I.; American Cyanamid Co., New York, New York, Ayles, A. W., Kumler, Ralph W., Patterson, D. E., (Stamford, Conn.), Landes, Chester G., (Stamford, Conn.), Pulman, J. C., (Stamford, Conn.), Simser, L. S.; American Resinous Chem. Corp., Peabody, Massachusetts, Abramowitz, Wm.; American Viscose Corp. (Sylvania Division), Fredericksburg, Virginia, Brillhart, W. O.; Arvey Corporation, Chicago, Illinois, Tauth, George.

B

Bakelite Corporation, Chicago, Illinois, Myers, Arthur, Seiler, Charles J., (Bloomfield, N. J.); Belgium, Istas, Jean, Ministry of Colonies; Bergstrom Paper Co., Neenah, Wisconsin, Hansen, Paul B.; Bigelow Sanford Carpet Co., Thompsonville, Conn., Johnson, Charles R.; Bird Machine Co., Evanston, Illinois, Tipka, Vernon L.; Bird & Son, East Walpole, Mass., Adams, Daniel O.; Borden Company, Chemical Division, Bainbridge, New York, McFarren, Gerald A.; Brown Company, Berlin, New Hampshire, Archer, E. M.; Buckeye Cotton Oil Co., Memphis, Tenn., Gutliph, Earl W.

C

Carbide and Carbon Chem. Corp., South Charleston, W. Va., Broderick, A. S.; Champion Paper & Fibre Co., Canton, North Carolina, Betten, Cornelius, Jr., Heckel, Herman, (Hamilton, Ohio); Combined Locks Paper Co., Combined Locks, Wis., Steele, Cylde W. Vogt, R. A.; Congoleum Nairn, Inc., Kearny, New Jersey, Irwin, William Y.; Consolidated Water Power & Paper Co., Wisconsin Rapids, Wis., Farnsworth, Robert C., Grimes, William S., Somers, Jay G.; Continental Diamond Fibre Co., Newark, Delaware, Runyan, A.; Cox, Mrs. Percy J., Milwaukee, Wis.; Crossett Lumber Co., Crossett, Arkansas, Sandborn, L. T.; Crown Zellerbach Corp., Camas, Washington, Theller, H. W.

D

Detroit Sulphite Pulp & Paper Co., Detroit, Michigan, Larson, Leslie L.; Diamond Alkali Company, Painesville, Ohio, Neros, C. A.; A. B. Dick Company, Chicago, Illinois, Beatty, J. L. Glading, Ralph E. Hoover, K. S. Mann, J. A.; Dixie Cup Company, Easton, Pa., Schreiber Milton D.; Dixie Wax Paper Co., Memphis, Tenn., Bryce, Wm. H., Jr.; Dow Chemical Company, Midland, Michigan, Lalk, Robert H., Measberg, Albert T., Stilbert, E. K.; The Drackett Co., Cincinnati, Ohio, Calvert, Francis E.

E. I. du Pont de Nemours, Chicago, Illinois, Betty, James C., Bradner, Don, (Wilmington, Del.), Czerwin, E. P., (Niagara Falls, N. Y.), Hoerig, H. F., (Buffalo, N. Y.), Read, George W., Stockfleth, A., (Arlington, N. J.), Warner, Robert R., (Wilmington, Del.), Wormald, George, (Newark, N. J.); Durez Plastics & Chemicals, Inc., North Tonawanda, New York, Hull, Minert E., Ruff, H. B.

E

Eastman Kodak Co., Rochester, New York, Salo, Martin; E. B. Eddy Company, Hull, Que., Canada, Gallay, W.; Esso Standard Oil Co., New York, N. Y., Slotterbeck, O. C.; Excello Corporation, Kollen, Myron.

F

Falls Paper & Power Co., Oconto Falls, Wis., Aderman, Merrill J., Grabowski, Henry, Marteny, W. W.; Fibreboard Products, Inc., Antioch, California, Gardner, Howard S.; F. G. Findley Company, Milwaukee, Wis., Batchelder, G. W., Lyon, James R.; Forest Products Research Laboratory, Princes Risborough, England, Campbell, W. G.; Forest Products Laboratory, Madison, Wis., Fahey, Donald J., Seidl, Robert J., Stamm, Alfred J.; The Formica Company, Cincinnati, Ohio, Pitzer, J. C.; The Foxboro Company, Chicago, Illinois, Schreiner, Milton A.; Fox River Paper Corporation, Appleton, Wis., Dixson, H. P., Hayden, Ralph S.

G

Robert Gair Co., Inc., Uncasville, Conn., Aid, Joseph J., Max, K. W.; Gaylord Container Corp., Bogalusa, La., Pollet, Dalton L.; B. F. Goodrich Chemical Co., Cleveland, Ohio, Alexander, Claude H., Morris, W. E., Osborne, Edward B., Segner, C. D., (Chicago, Ill.), Steller, Roger L.; The Goodyear Tire & Rubber Co., Akron, Ohio, Aiken, Wm. H., McNeer, C. O., (Chicago, Ill.); Grand Rapids Fibre Cord Co., Grand Rapids, Mich., Kitchen, Dean, Parcels, A. Arnold; The Gummed Products Co., Troy, Ohio, Mosher, Owen D.

H

Hammermill Paper Co., Erie, Pennsylvania, Rasch, R. H.; Hercules Powder Co., Wilmington, Delaware, Brown, W. C., Campbell, W. P., Fitzgerald, L. E., (Milwaukee, Wis.), Kein, Gerald; Hoberg Paper Mills, Green Bay, Wis., Charles, A. B., Faulkender, C. R., Raymaker, Norman F.; Hollingsworth & Whitney Co., Waterville, Maine, Whitman, Frank A.; Homasote Company, Trenton, New Jersey, Becher, H. L.; Hummel & Downing Co., Milwaukee, Wis., Cox, Percy.

I

Imperial Paper & Color Corp., Glens Falls, New York, Blakeslee, Robert B.; India, Embassy of Washington, D. C., Aggarwala, J. C.; The Institute of Paper Chemistry, Appleton, Wis., Forman, L. V., Goodman, R., Graff, John, Heath, M. A., Howells, T. A., McCabe, E. L., Sears, G. R., Swanson, John W.; Interlake Chemical Corp. Chicago, Ill., Bonneville, A. B., Horn, John S, (Cleveland, Ohio); International Paper Co. (Southern Kraft Division), Mobile, Alabama, Mabrey, G. S., Pesch, A. W.

J

Joanna Western Mills Co., Chicago, Ill., Beck, H. L.

K

Kimberly-Clark Corporation, Neenah, Wisconsin, Arnold, William E., (Kimberly, Wis.), Bellings, R. M., Bletzinger, J. C., Craig, K. A., Harwood, K. J., Mayo, Howard A., Rogers, S. C., Valentz, John E.; Koppers Company, Inc., Petrolia, Pennsylvania, Winne, C. K. M.; Kraft Foods Company, Glenview, Ill., Hayhurst, Lewis J.; K. V. P. Co., Kalamazoo, Michigan, Germanson, R. C., Hurst, R. H.

L

Lee Paper Company, Vicksburg, Michigan, Kukolich, Stephen.

M

Makara, Frank, New York, New York; Marathon Corporation, Menasha, Wisconsin, Charlton, F. S., Davis, Donald W. Forcey, George W., Gehrke, Willard H., Heald, A. H., Helms, John F., Henschel, Raymond W., (Menominee, Mich.), Jankowski, Arthur F., Metz, Peter J., Schmidt, August F., Shipman, L. A. Simerl, L. E., Spalding, John; Marinette Paper Company, Marinette, Wisconsin, Rasmussen, E. W.; Mathieson Chemical Corp., Niagara Falls, New York, Clark, C. C.: Mead Corporation, Chillicothe, Ohio, Redd, John C.; Milprint, Inc., Milwaukee, Wisconsin, Vaurio, Frans; Minnesota and Ontario Paper Co., International Falls, Minnesota, Lagerpusch H. H., Lauring, E. A.; Minnesota Mining and Manufacturing Company, St. Paul, Minnesota, Auger, Bertrand Y., Binek, Paul H., Christensen, O. C., Dahlquist, Carl A., Kluz, S. J., McKee, Wm. Myron, Reid, Thomas S.; Modern Plastics Magazine, Chicago, Illinois, Wright, Val; Monsanto Chemical Co., Springfield, Massachusetts, Barkhuff, Raymond A., Jr., Bainbridge, John, (Boston), Niles, George E., (Boston); Mosinee Paper Mills, Mosinee, Wisconsin, Grandall, H. C., Line, J. D., Martin, George E.; Munsing Paper Co., Munising, Michigan, Hechtman, John F., McIntyre, James W.

N

Nadelman, A. H.; National Adhesives Co., Chicago, Illinois, Sanders, Fred W.; Neenah Paper Company, Neenah, Wisconsin, Adrian, A. P.; Nekoosa-Edwards Paper Co., Port Edwards, Wis., Burk, William H.; New York State College of Forestry, Syracuse 10, New York, Jahn, Edwin C.; Nopco Chemical Co., Milwaukee 11, Wisconsin, Chadwick, Frank J., Morehouse, Walter B. (Harrison, N. J.).

O

Ohio Boxboard Co., The, Rittman, Ohio, Feola, J. A.; Orchard Paper Co., St. Louis, Missouri, Levine, Benjamin; Owens-Illinois Glass Co., Toledo, Ohio, Pellett. F. G.

P

Panelyte Division, St. Regis Paper Company, Trenton, New Jersey, Deasy, W. E., Yorke, N. R.; Paper Mill News, New York City, Cornell, John; Pittsburgh Plate Glass Company, Milwaukee, Wisconsin, Helbing, Clarence, Moffett, Eugene W.; Plaskon Division, Libby-Owens-Ford Glass Co., Toledo, Ohio; Hesselbart, R. C., Francis, William C.; Plastic Film Corporation, Plainfield, Connecticut, Rich, John H.; Plywood Research Foundation, Tacoma, Washington, Mieler, John G.; Polytechnic Institute of Brooklyn, Brooklyn, New York, Mark, H.; Pyroxylin Products, Inc., Paoli, Pennsylvania, Yoder, Paul H.

Q

Quartermaster Food & Container Institute, Chicago, Illinois, Eppell, Norman S.

R

Reichhold Chemicals, Inc., Detroit, Michigan, Klug, W. W., Smith, James C.; Resinous Products and Chemical Co., Philadelphia, Pennsylvania, Bretl, Martin F., Fineman, Manuel N., Taft, Philip B.; Rhinelander Paper Company, Rhinelander, Wisconsin, Becker, Gustave